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S.W.

HOW TO STRENGTHEN THE MEMORY;

OR,

NATURAL AND SCIENTIFIC METHODS OF NEVER
FORGETTING.

BY M. L. HOLBROOK, M. D.,

EDITOR OF "THE HERALD OF HEALTH," AUTHOR OF "HYGIENE OF
THE BRAIN," "PASTURITION WITHOUT PAIN," "EATING
FOR STRENGTH," FRUIT AND BREAD," ETC.

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PREFACE.

Some years ago I commenced investigating the various systems of mnemonics in connection with my friend, Mr. John Fretwell, of Eisenach, Germany. Whatever came in my way I gave to him, and whatever he found in his extensive travels and reading he at once communicated to me. The result was a mass of incongruous material, much of it having little value.

We found that most systems of mnemonics are altogether too cumbersome—using them is like employing a large amount of machinery to accomplish a small amount of work. It is more difficult to handle the machinery than to do what is to be done by simple and natural methods. These methods are given in this book. They are all easy, and adapted to every class of persons, be they learned or unlearned.

Let no one, however, imagine he can train and discipline his memory by reading this book; he must apply its principles, and that, too, for a long time. A half hour given to the subject every day so keeps the matter in hand that in the course of time every person with a weak and defective memory may have a strong one. The extent of its strength will depend largely

PREFACE.

upon the patience and perseverance of the pupil. I advise him to use the work as a text-book, and master every principle contained therein, so that they become a part of his mental organization. These principles are the laws of association, comparison, attention, repetition and the securing of a vivid first impression; minor details, important as they are, will easily be learned. Those who wish to possess memories of great power, and become able to master the most difficult subjects if nature has not given them the requisite ability, can do so by hard work, and by no other means. All will find that the rational methods of memory culture advised will not only strengthen this faculty, but every other intellectual faculty. That the work may prove useful to all who study it is my sincere desire.

M. L. H.

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HOW TO STRENGTHEN THE MEMORY.

CHAPTER I.

INTRODUCTORY.

Memory may be defined as that intellectual power which enables a person to recall, with more or less distinctness and accuracy, past experiences, facts which have before been in the mind, forms, faces, figures, words, phrases, emotions, sounds and colors which have previously exercised the brain. Or it may be defined as a kind of resurrection or reproduction of the past, or a perception of anything with reference to its past existence, or a vision of time past. Memory appears to be a property of living matter ; at least a property of it after it has become organized into a nervous system.

There seems to be a close relation between memory and instinct; the latter being memory carried to a point in which forgetfulness is next to impossible. The bee, for instance, knows how to build its cell, because its ancestors have practiced building cells for countless ages, and organized their experience into an instinct. The child learns its letters, and in after years they are perfectly familiar to it, because its memory of them has become positive knowledge organized into the structure and action of the brain. At this point it is no longer memory, but what in animals we call instinct.

Memory is necessary because it is of the highest importance to us that we be able to recall past experiences and events, and because it is impossible for us to keep our acquisitions of knowledge constantly present in our minds. Most of our mental acquisitions we keep in the realm of unconsciousness, and call them up by various methods when they become necessary.

Memory is a limited faculty. It would be as impossible for a human being to recall all past experiences as it would be to lift the globe, or turn it from its orbit; we recollect only what

has been so well impressed on the brain as to have become a part of its structure. Other experiences we forget, and forgetfulness seems as necessary as memory ; otherwise the brain would become so occupied in holding its acquisitions that it would not be able to attend to the new demands made upon it.

Memory is not a perfect faculty. It has been demonstrated that the human eye is not, mathematically, a perfect instrument for the reception of light. Opticians have pointed out several particulars in which it might be improved. It does not give a perfect image of what it sees. It is doubtful if any of our organs are so perfect that we cannot conceive of improvements in their structure. It would astonish most people to be made aware of the imperfections of their recollections—their crudeness, their inaccuracies, their frequent untruthfulness. To challenge the veracity of a person's memory is considered about as great an insult as one person can offer to another, and such an insinuation would be resented almost as much as to question his mental soundness. A majority of us are inclined to be very sure about matters of recollection until we have tested ourselves in a

most rigorous manner. The judge in court, and the lawyer at the bar know how imperfect the memory is, and how often it convicts an innocent man or saves a guilty one from punishment. The past rarely appears to us as it really is, but is in numerous ways altered and softened. It falls much below in vividness the reality, and the intensity of the first impressions of the recollection is so indistinct that the minor details disappear, and only fragments of our past experience are restored. Let any person who has nothing but his recollection to aid him undertake to write his autobiography, and he will find that only a few main features of his career have survived ; all others have faded away, or the impression of them has become so feeble that they cannot be recognized. The memory drifts about helplessly, and at last, if the man is imaginative and not over honest he creates in his mind the facts, disarranges the incidents or puts them in the wrong place, and ends, finally, by reconstructing a new past, which never existed.

And not only is the memory an imperfect and limited faculty, but it is subject to illusions. We all know that in diseased mental states illu-

sions are common ; but all do not know that persons in perfect health are also subject to them, especially if they have not trained and disciplined themselves in a rational manner. What is an illusion ? It may be defined as a partial displacement in the mind of a fact for a fiction, of a truth for a falsehood. If we remember a past event imperfectly it is not an illusion ; but if we remember it differently from what it was, it is. For instance, a friend who would not falsify for anything, argued for several weeks with me that on one occasion I wrote a letter on a certain subject, at a certain time, relating to a business transaction which I knew I could not have written. So firmly was this fixed in his mind that he became quite irritated at my statement that the letter to which he referred was written a year previously and related to a different transaction. The letter was at last found, when it was proved that I was correct and he incorrect. He had remembered that there was a letter, but had substituted another date for the true one, and another subject ; or, in other words, there had been an illusion by a partial displacement in the mind of a fact for a fiction. Such illusions

are common to all of us, but especially to children, and persons of an imaginative turn of mind, and to those whose mental faculties are not well-balanced and carefully disciplined.

The physiology of memory is a subject of profound interest, and our students of mental science have done much to throw light upon it ; but there is grave doubt if they can ever entirely penetrate the mystery. Still some things are known. In the first place, it is a settled fact that it is the brain which remembers, and not any spiritual organ which we cannot take cognizance of. And then it is probably true that when we remember anything it is the same region of this organ which revives the former experience. That is to say, memory is a localized faculty. Not that every variety and description of memory has exactly the same location in the brain, but that every special memory has. For instance, the memory of color, of form, of words, have their places in the brain, though we may not be able to point them out. Then, again, the memory depends on the integrity and soundness of the brain ganglia. If these are diseased memory may be entirely wanting ; or, if present, manifest abnormal

states, such as illusion, hallucination, etc. Then, again, memory depends upon the flow of blood to the ganglia, so that what we call nutrition may go on. A brain cell can no more work without the force which it derives from the blood than a mill can work without the force derived from water, or wind, or steam. The difference is, one is a vital while the other is a physical process. If the blood is deficient, then the memory is, for the time, feeble ; if the blood is modified in any way, the memory will also be modified. Even a diminution of the oxygen of the air which the person inhales affects the memory unfavorably. There are some drugs, as the bromides of potash and soda, which depress the memories of those who take them for a long time, and there are other substances which temporarily increase our memories. All are familiar with the fact that a man will remember things when partly drunk that he will forget when sober, though intemperance injures the faculty in the long run. Loss of sleep deteriorates the memory, and so does overwork, and mental and physical exhaustion, the lowering of the circulation, and other similar conditions.

But still we have not answered the question, How do we remember? One old theory was that facts were impressed on the mind like a stamp on wax. This was very simple, and for a while served to explain the subject, but it does not answer now for any but children. Facts are not impressed on the mind like a seal on soft wax. Another theory is, that memory is a molecular action in certain brain ganglia. No doubt molecular action does take place when these ganglia work, just as it does when any other tissues are in action. Still, this is not an explanation that explains. Who knows anything about molecular action in the brain? The nearest we can get to an explanation of the subject is, I believe, that the brain cells have the power of reproducing certain conditions, either by acting in a certain way or taking on a certain form which reproduces in them the same state of mind that occurred before. We may compare memory to muscular action; if the biceps contract it flexes the arm, and if it is trained to contract in a certain way it will reproduce the same conditions again and again. So, too, if the brain cells are trained to act in a certain way they bring forth the same result,

no matter how often repeated. Physiologists speak of the brain as registering impressions. This is all very fine to read ; but it seems about as far-fetched as to say that impressions are stamped upon it. The truth is, the brain has the power to reproduce certain conditions just as the muscles have, and if we are conscious of these conditions, this is memory.

There are some other questions that should be considered. It has become a proverb that "what is soon learned is soon forgotten." This is not always true, but most frequently it is. It is difficult to understand why this is so, unless we take a broad view of the subject. There is a great difference between knowing a thing and remembering it. A person possessing a clear understanding and quick perceptions will glance at a subject, have a perfect knowledge of it for the moment, but not be able to remember it after it has passed from his mind. The faculty of memory has not been called into play, but only his understanding. We say, he learns easily, which may be true ; but he remembers with difficulty. On this subject Dr. J. Mortimer Granville makes the following remarks: "Just as a man works out a prob-

lem or performs a mathematical calculation with perfect command of the data and processes involved, but in no way burdens his mind with the details, or even the results of his work if they do not personally concern him, he may concentrate attention and bring his reasoning faculties to bear on a subject of study, and master its details so as to obtain a clear comprehension of the whole, while he is not registering any impression to form the basis of memory. Indeed it is a notable circumstance, that in a large class of minds the faculty of apprehension is developed, so to say, at the cost of memory ; the whole force of the intellect being, as it were, expended in understanding, while the storing of impressions is left to chance, which generally means it is wholly neglected. It is, therefore, important to bear in mind that a quick understanding does not either involve or imply an aptitude for study. It is simply an effectual power of perception, and is not uncommonly associated with a tendency to forget, which is, in truth, the effect of an absence or inefficiency of the faculty of remembering. The distinctness and almost antagonism of these two functions of the brain, understanding

and memory, is curiously apparent in the fact that idiots have often extraordinary powers of retention and recollection, while the most intelligent hearers and readers often find to their cost that they are the most forgetful. The student should not allow the consciousness that he has a quick understanding to encourage him to neglect to cultivate his memory, or to be misled by a good memory to assume that he is endowed with a high intellectual ability."

THE BEST FOUNDATION FOR A GOOD
MEMORY.

Robust health is the best foundation upon which a good memory may be built. I do not mean that all healthy persons have good memories, but that persons with good health, other things being equal, will remember more than those who are in a low physical condition.

A good memory cannot be preserved with an impaired nervous system. Not only may a long-continued wakefulness change the temper of a mild and gentle person, completely alter his features and expression and occasion a de-

velopment of singular and most uncomfortable whims, but also cause great deviation in the powers of intellect and imagination, and ruin the ability to recall facts and ideas.

The gift of remembering is dependent upon the power of strict attention. And this is dependent not only upon discipline, but upon the comfortable condition of the body, which only comes from a good circulation and abundant blood. Great orators usually have powerful memories. Without readiness and quickness in the flow of words oratory is impossible. Sometimes orators temporarily paralyze their memories by physical exhaustion. Mr. G. J. Holyoke said in a little work of his own on oratory: "When traveling expenses were the only thing that I received for my lectures, I used to walk to the place of their delivery. On my walk from Birmingham to Worcester, a distance of 26 miles, it was my custom to recite on the way portions of my intended address. In the first part of my walk my voice was clear and my memory was good; but towards the end I could scarcely articulate or remember the thread of my discourse. If I lectured the same evening, as sometimes happened, I spoke with-

out connection and produced little effect upon my audience. The reason was that I had exhausted my strength and paralyzed my memory. One Saturday I walked from Sheffield to Huddersfield to deliver two lectures. It was my first appearance there, and I was anxious to make a good impression ; but in the morning I was unable to do more than talk half inaudibly and incoherently. In the evening I was tolerable, but my voice and memory were weak. My annoyance was excessive. I was a paradox to myself. My power seemed to come and go by some eccentric power of its own. I did not find out until some years after, that exhaustion of my strength had exhausted my powers of speech, thought and memory, and that entire repose instead of entire fatigue should have been the preparation for public speaking."

MEMORY AND NUTRITION.

Every act of memory produces a permanent modification of the brain ; but the nature of this modification cannot be known. Whatever this change may be, it must be accomplished

through nutrition. This organ, and especially the gray substance, the seat of memory and cerebration, receives a very large supply of blood—no other part of the body receives so much—and nutrition goes on here at a very rapid rate. In proportion as nutrition is perfect memory is good. This helps us to understand why the power of recollection in the young is so much better than in that of the aged. Their brains are better nourished, and the blood circulates in them more perfectly. The color of the surface of the brain of a child is rosy; that of an old person is yellowish; and these facts indicate that one is being well fed with an abundance of rich blood, and that the other is not. This fact has an important bearing on all our efforts to strengthen this faculty; not only must the brain be properly exercised, but it must be well nourished.

FATIGUE.

Fatigue of every form is weakening to the memory. Impressions received when we are tired are not permanently fixed in the mind, and their reproduction is often impossible. Fatigue is the result of an excessive activity of

any faculty, continued until its stored-up nutriment is exhausted. After a period of rest, and a return to normal conditions, the memory also returns. A very interesting illustration of the result of fatigue upon memory has been given by Sir Henry Holland. He says: "I descended on the same day two very deep mines in the Hartz Mountains, remaining some hours underground in each. While in the second mine, exhausted by fatigue and inanition, I felt the utter impossibility of talking longer with the German inspector who accompanied me. Every German word and phrase deserted my recollection; and it was not until I had taken food and wine and been at rest for some time, that my memory returned."

A fact like this, and many others which might be mentioned, goes to show that there is a close relation between memory and nutrition.

PERFECT CIRCULATION OF BLOOD.

Memory is also, to a large extent, dependent upon a perfect circulation of the blood in the brain. The following case illustrates the effects of impeded circulation of the blood on the memory, and is also a very interesting account of

the workings of the mind in sleep, as given by Mrs. Agassiz in the life of her husband :

“He [Agassiz] had been for two weeks striving to decipher the somewhat obscure impression of a fossil fish on the stone slab in which it was preserved. Weary and perplexed he put his work aside at last, and tried to dismiss it from his mind. Shortly after, he one night awoke persuaded that while asleep he had seen his fish with all the missing features perfectly restored. But when he tried to hold and make fast the image, it escaped him. Nevertheless, he went early to the Jardin des Plantes, thinking that on looking anew at the impression he should see something which would put him on the track of his vision. In vain—the blurred record was as blank as ever. The next night he saw the fish again, but with no satisfactory result. When he awoke it disappeared from his memory as before. Hoping that the same experience might be repeated on the third night, he placed a pencil and paper beside his bed before going to sleep. Accordingly, toward morning, the fish reappeared in his dream, confusedly at first, but, at last, with such distinctness that he had no longer doubt

as to its zoological characters. Still half dreaming, in perfect darkness, he traced these characters on the sheet of paper at the bedside. In the morning he was surprised to see in his nocturnal sketch features which he thought it impossible the fossil itself should reveal. He hastened to the Jardin des Plantes, and, with his drawing as a guide, succeeded in chiselling away the surface of the stone under which portions of the fish proved to be hidden. When wholly exposed, it corresponded with his dream and his drawing, and he succeeded in classifying it with ease. He often spoke of this as a good illustration of the well-known fact that when the body is at rest the tired brain will do the work it refused before."

QUALITY OF BLOOD.

The quality of the blood must also be considered. Th. Ribot, in a work upon diseases of the memory, says: "Fever in its various stages is accompanied by extreme activity of the brain. In this activity the memory takes part. We know that in fever the rapidity of the circulation of the blood is excessive; that this fluid is altered from its normal state and charged

with the waste product arising from rapid combustion. In this state persons often remember impressions of trivial things, in which no interest was taken, while, perhaps, more important impressions are forgotten. It will generally be found that such impressions were received when the energies were high; when exercise or pleasure, or both, had raised the action of the heart. We may note, also, the ease and rapidity with which we remember at that period of life when the blood is driven through the vessels in plentiful and swift-moving streams, and how difficult it is to remember when the circulation of the blood diminishes with advancing years. It is also well known that in the latter part of life the composition of the blood is changed, and it is less rich in red corpuscles and albumen. When this is exhausted by long illness memory is enfeebled with the circulation."

Herbert Spencer writes: "Highly nervous persons, in whom the action of the heart is greatly lowered, habitually complain of loss of memory and inability to think—symptoms which diminish as fast as the natural rate of the heart beats is regained."

Medicines and narcotics affect the memory temporarily, for good or evil, according to their action. Hashish, opium and similar drugs excite the nervous system and increase the powers of memory, so long as their effects continue. When these are lost, a condition of utter forgetfulness takes their place. Bromide of potassium is a good illustration of a drug which retards the circulation of the blood in the brain, and thus weakens the memory. I have known a professional man who nearly lost his powers of recollection by using this medicine to cause sleep, which only returned when he gave it up.

A man's memory is like a fine horse. To do its best work it must have good treatment. It must neither be neglected nor overworked. It can easily be so abused by irregular and unsystematic employment as to become a cause of annoyance and discomfort; or, again, it can be so overworked and heavily taxed that it becomes practically the chief organ or agent of the entire system, every other portion dwindling in comparison. The latter course is the great danger of those who value the help of a tenacious memory. Both memory and a horse are valuable, not in proportion to the burdens

they can carry, but in proportion to their training for the work of the body as a whole ; and either of them is made effective only by such a course of life and training as shall bring them up to their best condition and hold them there permanently.

MEMORY AND BODILY ILLNESS.

RESULTS OF BRAIN INJURY.

Dr. Andrew Wilson, in an essay on this subject, says : "In cases of head injury involving loss of consciousness, the patient, on recovery, recollects the details of his past life, save those which concern a short time before the accident. The period immediately preceding the accident remains a blank in the memory. There is a perfect recollection of every event up to within a certain period before the accident. Of the events of this period, the patient on recovery can remember nothing. A man falls down a deep well, sustains severe concussion of the brain, and on recovery is amazed at the loss of memory for events occurring just before his ac-

cident. 'He actually makes guesses at his proceedings, but fails to explain to his own satisfaction, or that of anybody else, what he was doing to the well and its rope.' A lawyer, after concluding an intricate piece of business, goes for a ride on the sands. He is thrown from his horse, and sustains brain concussion. After his recovery, he can recollect nothing whatever of the business in question, although his memory for events long prior to the accident is as good as ever. The 'lost hour' in such cases is that just before the accident. That it is, which is the unwritten part of the mental slate, or, rather, the part of the mental slate the writing on which has been blurred, obscured or rubbed out altogether.

"It becomes evident that in the details of such curious results of brain injury and of loss of memory, we should find some clue to the nature of the memory processes. The expression concerning a thought being 'driven out of one's head' would appear to possess an actual parallel in the history of the physical accompaniments or basis of memory. The inferences which may be drawn from such cases are clear enough. As Mr. Bell has pointed out, in the

act of what is named 'memory' there are at least two distinct processes involved. There must be a reception or recording by the brain-cells of the brain of the impression made upon the organs of sense. The 'gateways of knowledge,' as Prof. George Wilson long ago named the 'senses,' receive and transmit to the brain, and, if recent research is to be trusted, to special parts of the central organ of the nervous system, the impressions we ordinarily speak of as the result of seeing, hearing, etc. Then the exercise of memory involves the power of recalling these impressions—a process varying greatly in different persons in respect of the ease, rapidity and exactitude with which it is effected. So much, at least, is perfectly clear as regards the nature of memory-acts ; and this statement may be accepted without hesitation, though we may be very far from understanding the *rationale* of the processes.

“It would seem to be a matter of tolerable certainty that each impression made upon the brain-centers, requires for its repetition and preservation, a certain period of time. The cases of brain concussion we have studied prove this. As the sensitive plate of the photographer

requires a certain period of exposure for the reception of the image, and as a still further period is necessary for the fixation of the image thereon, so the nervous mechanism demands a certain period for the fixation of the impressions which are to do duty in the 'memories' of the future. As Mr. Savory puts it, the mental ink must have time to dry. Any blurring, resulting from concussion, will render the after-production of the impressions which we name 'memory,' imperfect, feeble, or it may be, altogether impossible.

RESULTS OF THE USE OF NARCOTICS.

"In opposition to the loss of memory for immediately preceding events, which a severe shock to the brain is known to entail, Mr. Bell records what is a common enough experience of all who have had much to do with the administration of chloroform or other narcotics, namely, that 'almost always, intelligent patients can recall with great accuracy the last words spoken before unconsciousness.' In other words, the insensibility of the brain produced by chloroform does not erase the memory-faculty for occurrences just preceding the admis-

tration, as brain injury obscures the recollection of the patient. There is no 'lost hour' in the case of chloroforming, as in that of brain concussion. It may happen that if the patient is told to hold up one hand and to count aloud slowly while inhaling the chloroform, the hand falls as the patient ceases to count. After the operation has been concluded it often happens that the next number to the one last counted is slowly pronounced. What here happens is clear and patent enough. The chloroform has merely suspended intellectual operations, it has not destroyed them. It has made the period of insensibility alone a mental blank; it has left entirely untouched the registration of the memory-impressions which were present just before the artificial sleep, as it has not interfered with those which succeeded it. So, also, in slight attacks of epilepsy, the momentary loss of consciousness which occurs leaves the memory impaired; the patient naturally and exactly resuming his conversation as if no 'fit' had intervened.

"The interesting deduction, then, remains, that judging by the results of surgical experience, impressions need a certain period of time

their fixation in the brain. Of the exact time thus required for mental fixation of impressions we know nothing; but it is a perfectly justifiable inference that the period must vary with the individual. It is more than probable that the 'good memory' amongst other qualities, possesses that of ready, early and rapid fixation of impressions. The monotonous repetition of words and ideas used by many in committing facts to memory, in this light may be viewed as a clumsy method of assisting the powers of mental fixation in question. The individual who requires 'time to think' before he can guarantee his remembrance of what he has seen or heard, probably devotes the period of thought to unconscious and involuntary registration of the impressions he has received; and differences in the rapidity with which ideas can be reproduced in the work of the brain, may depend on the ease with which different individuals mentally effect this process of fixation, or it may depend on the fact that the brain ganglia, or centers, in some persons are more active than in others.

"That the mere process of receiving impressions and ideas which are afterwards repro-

duced by acts of memory may be of an instantaneous character, seems proved by many well-known instances familiar to physiological inquirers.

UNCONSCIOUS MEMORY.

“The following examples show that the memory faculty may be exercised unconsciously, and that the impression reproduced must have been received with marvelous rapidity and exactitude: In a Roman Catholic town in Germany, a young woman, who could neither read nor write, was seized with a fever, and was said by the priests to be possessed of a devil, because she was heard talking Latin, Greek and Hebrew. Whole sheets of her ravings were written out, and found to consist of sentences intelligible in themselves, but having slight connection with each other. Of her Hebrew sayings, only a few could be traced to the Bible, and most seemed to be in the Rabbinical dialect. All trick was out of the question; the woman was a simple creature; there was no doubt as to the fever. It was long before any explanation could be obtained. At last the mystery was unveiled by a physician, who,

after much trouble, discovered that at the age of nine she was taken into the house of a great Hebrew scholar, remaining there till his death. On further inquiry it appeared to have been the old man's custom for years to walk up and down a passage of his house, into which the kitchen opened, and to read to himself with a loud voice out of his books. The books were ransacked, and among them were found several of the Greek and Latin fathers, together with a collection of Rabbinical writings. In these works so many of the passages taken down at the young woman's bedside were identified, that there could be no doubt as to their source.

“In this case the fever served as a brain stimulant, and caused the reproduction of memories, of which, in healthy and normal existence, the patient could have entertained no recollection; and that impressions, thus reproduced, must also have been received rapidly and registered indelibly are also inferences of a justifiable kind. Michéa relates a case showing how instantaneously the memory faculty may operate. A young butcher, living at Bicêtre, suffered an attack of madness. During his paroxysms he recited entire passages from

the tragedy of 'Phèdre.' He had only once beheld the tragedy represented; and on his recovery failed to recollect a single verse.

"Another case is that of a man who, whilst a patient in a hospital, suffering from a head injury, spoke in a language during his partial recovery from illness, which no one could understand. The language was, however, found to be Welsh. The man was a Welshman; he had been absent from his native country so long that he had entirely forgotten his native tongue. When he recovered, he completely forgot his Welsh again and spoke the English language. The accident in this case had exhibited the effect of stimulating memories which had become obsolete."

MEMORY, ITS EXALTATION AND DEGENERATION.

EXALTATION.

An exaltation of memory is where a multitude of recollections spring up involuntarily on every hand. It has its cause in an increase of the

circulation of the blood in the brain. It frequently appears in acute diseases, especially in fevers. It is common in maniacal patients, and it sometimes appears as a feature of hysteria and in the early stages of brain diseases.

This subject of exaltation of memory will be best understood by some simple illustrations. There have been many accounts of persons saved from imminent death by drowning who all agree that at the moment of asphyxia they seemed to see their entire lives unrolled before them, even to the minutest detail. Some go so far as to say that every instance of former life seems to flash across the memory, not as an outline merely, but with every detail filled in with the most remarkable minutia—every act of life, whether right or wrong, comes back with great vividness. Ribot cites the case of a clear-headed man who was in the act of crossing a railroad track when an express train, running at full speed, appeared close at hand. The man had barely time to throw himself down in the center of the road between the two lines of rails; and as the train rushed over him, the feeling of impending danger brought to his recollection most vividly every act and incident

of his former life, so as to suggest to him the opening of "the great book at the last day."

There is, no doubt, much exaggeration in these statements, and such augmentation may be regarded as abnormal and undesirable, being indications of disease, but they teach one lesson to those who would strengthen their memories, and that is the value and necessity of a perfectly healthy and vigorous circulation of blood in the brain.

DEGENERATION.

The same lesson is taught by an opposite condition from that of an exaltation—a diminution of the normal memory by a decay or withering of the brain cells and a diminished supply of blood to the parts.

The loss of memory in the aged is a familiar example, and can only be accounted for by a deterioration of the brain elements and a diminution of blood supplied to them. One of the worst features of such cases is the fact that an old person is not for a long time after decay has begun aware of it. I am now treating a case of loss of memory in a person advanced in years, who did not know that his memory had failed

most remarkably till I told him of it. He is making vigorous effort to bring it back again, and with partial success.

The method pursued is to spend two hours daily, one in the morning and one in the evening, in exercising this faculty. The patient is instructed to give the closest attention to all that he learns, so that it shall be impressed on the mind clearly. He is asked to recall every evening all the facts and experiences of the day, and again the next morning. Every name heard is written down and impressed on his mind clearly, and an effort made to recall it at intervals. Ten names from among public men are ordered to be committed to memory every week. A verse of poetry is to be learned, also a verse from the Bible, daily. He is asked to remember the number of the page in any book where any interesting fact is recorded. These and other methods are slowly resuscitating a failing memory.

The aged should all look to this danger in their lives and resolve to combat it from the very first. By so doing they will make their declining years more enjoyable, and give much greater pleasure to their friends. Unceasing

self-culture, especially in preserving the memory and intellectual faculties, should constitute a considerable part of the life of every aged person, even more than of the young. Only by it can this period of life be rendered pleasant and profitable. The beneficial effect of this course on the general health is also very considerable.

ATTENTION.

When any person has decided to train and strengthen his memory, he will find it of great advantage to know some of the first principles upon which to proceed. In this and the following pages I shall give such suggestions as will make memory culture much less difficult and more certain than when pursued in a loose and irregular manner.

The most important point is to give strict and undivided attention to the matter to be remembered, so that the first impression shall be a vivid and strong one. I believe that all writers have recognized this fact, and if it were fully understood and practiced it would make memory culture comparatively easy. If any one will watch the intellectual processes of his

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own mind, it will not be long before he will discover that the distinct recollection of any fact or idea is, as a rule, in direct proportion to the vividness of the first impression and the attention with which it has been received.

There are two ways in which attention is exercised. There is the involuntary or automatic attention which one gives to any subject without the aid of the will; it has little directness and little value. By it the mind is never concentrated on any subject; it is the kind of attention which too many students give. It is much less straining to the brain, and will do very well for invalids and weaklings. Digestion, respiration and the circulation of the blood may well be left to the involuntary action of the organs concerned; but earnest students will not leave mental culture to the involuntary, almost unconscious day-dreamings and absent-mindedness of the nervous system. They will direct their thoughts by an earnest effort of the will. The degree to which they will do this must be decided by their own powers. Long-continued attention to one subject is exhausting, and must be relieved by change. This is particularly the case with children. Their wills

are weak and not capable of holding the mind for a long time to one subject. Involuntary attention is injurious to the intellectual faculties. It keeps the thoughts on the lower range of brain action, and never spurs the nervous system up to its best. Voluntary attention is bracing and tonic in its effects. By it one can accomplish almost any task.

In training the attention one must be careful and not direct it altogether through one channel. There is attention and memory through hearing, sight, touch, taste and smell. Every sense has a memory of its own. For the purpose of memory culture, hearing and sight are all that I need here to consider.

We acquire most of our knowledge through the senses, and in our efforts to strengthen the memory it will be well to bear this in mind. In listening to a lecture, for instance, it is mainly the sense of hearing that is taking in the words and thoughts of the speaker. In reading the same lecture, the impressions come through the sense of sight, and the effect is somewhat different. The person who reads a discourse will remember it differently from the one who hears it, so it is well to make both

senses aid us. This gives added power, develops the brain in new ways and aids us in correcting by one sense erroneous impressions of the other.

REPETITION.

If the attention has been properly directed to the subject in hand repetition is less necessary, but in any case it is important. There are a few persons whose mental vigor is so great that once hearing or seeing anything is sufficient; but their number is small. The reason why a child learns its mother tongue is because the words and phrases are being constantly repeated to it and by it. Let the child after learning to talk fluently, be taken to a foreign country, where it cannot hear its own language for years, and it forgets it. Why? Because there is no repetition. So it is with other things. The student forgets much of his Latin and Greek if he does not constantly study them; the musician forgets his music if he does not practice, and the physician his knowledge of medicine. I believe that next to attention sufficient to make the first impression a vivid one, occasional repetition is the greatest aid one can

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have to insure strength and efficiency of the memory. If the first impression has not been a vivid one, the number of repetitions must be extended many times. This is a fact which I have tested, and which any one may test for himself with very little trouble.

SUGGESTION, ASSOCIATIONS, LINKS AND CHAINS.

Few realize how great is the influence of suggestion upon the memory. A thought by itself is not easily called up; but some other thought in no way related to it is brought to the mind by a friend, by reading, or some incident, and, lo, the forgotten one comes to mind instantly. If any one will watch the processes of his own mind for even one day, he will be astonished to see how much the course of his thoughts has been determined by some little thing that suggests something else, and so on.

To illustrate. This morning I received a letter from an entire stranger. It so happened that it bore the postmark of a town near which I lived in my youth. On seeing this mark, it

immediately suggested to my mind and called up a whole train of youthful memories that had not been thought of for years. One after another visions of old friends and scenes came flowing back again in rich abundance. Why was this? Simply because the little postmark suggested a thought which led to them.

Since I have been studying this subject I have observed, time and again, how one story told by a friend at the dinner-table suggests another, and so on for a whole hour; how one remark will often decide the whole course of conversation for a long time, simply because the idea seemed to be so related to what followed as to suggest it. Indeed, one may be almost certain that one's thoughts and acts of any day have been largely determined by his preceding acts and the acts of those with whom he has come in contact. Our memories are matter of suggestion, associations, links and chains of thought, so related to each other that one brings up another, and so on indefinitely. It is by taking advantage of this bond of association of ideas that we form all rational methods of strengthening the memory. Dr. Andrew Wilson says on this subject:

“A ‘first principle’ in the education of the memory consists in the cultivation of habits of mental association as part of our daily practice of thought. All systems of mnemonics utilize this principle of association in the culture of the recollective powers. Their aim is the endeavor to instil, by one means or another, the habit of linking together those thoughts that are naturally related. The more easily this is accomplished, the more readily does the memory become available for its work. The difference between one system of memory-education and another lies in the more or less natural method in which the teacher seeks to group the thoughts of his pupils, and to accustom them to arrange their ideas. It is the want of such a natural system of ‘linkage’ which frustrates most of the educative efforts of our day. Masses of facts are presented to the minds of boys and girls at school, in a crude, undigested form. They are left to acquire them without the slightest attempt at making an arrangement or formulating a method of remembrance. Memory-powers are not encouraged, but the reverse, in our system of education. I say this because I have been engaged for years in the practice

of teaching, and because I have been a daily witness of the defects of education in this respect.

“It is desired, say, in teaching botany, to impress on the pupil’s mind the parts of a flower. Science teachers find that notwithstanding abundant demonstration and repetition of names, the facts taught are forgotten in a few days or even hours. The pupil having been shown the parts of the flower, having heard them named, having named them himself, and having written them down in his note book, might be regarded as fully supplied by eyes, ears and intellect with the knowledge it is desired he should remember. Yet, on being questioned next day respecting his lesson, his mind is often a blank regarding half of the facts. The reason of his teacher’s disappointment is not far to seek. The facts were supplied to the pupil without any attempt at associating them. Even in ‘learning’ the multiplication table there is association of numbers, so often repeated, that the mere rythm of the table fixes the details on the mind; but in the botanical lesson, and with all its demonstration of the object with which it deals, there has

been no 'linkage' of ideas, except a simple and natural association of one with the other.

"In the practice of teaching, it is easy, I think, to better this state of matters. I have found, as a matter of experience, that without using any artificial stimuli to memory in the shape of links or clues, the facts presented say, by a flower, may be made to dwell permanently in the mind. Thus, supposing I am dealing with the green *calyx* of a buttercup, forming, as does the *calyx*, the outer circle of leaves in the flower. The pupil sees the five green leaves, he calls them *sepals*, and he knows they form the *calyx*. Now, if I allow him to think of *calyx* alone, or of *sepals* alone, I feel tolerably certain he will not recollect one or the other. But if I insist on his never thinking of one (*calyx*) without at the same time thinking of the other (*sepals*), I am almost confident both will be remembered. So is it with other parts of the flower, and so it is with other studies. We do not require artificial links when, as it seems to me, nature has, in the majority of cases, supplied natural ones in the ordinary associations of the objects we think about. If I am content to allow a pupil to think

of the parts of the pistil of a flower as three separate and distinct items—*ovary*, *style* and *stigma*—the chances are that when he desires to recollect the parts of the pistil, his memory will fail him, simply because the parts have never been associated in his mind. But if, on the other hand, he is taught from the first to think of *ovary*, *style* and *stigma* as three connected ideas and parts, he can no more avoid remembering all three than he can think of a man without thinking of his head.

“This natural association of thoughts serves our turn in the acquirement of the memory-powers which stand us in good stead when we gain the power of repeating poems and other compositions, involving, it may be, many hundreds of lines and ideas. As a matter of personal experience most of us know that we recollect the gist of the poem and the succession of its verses most readily when the association of the events it describes is clearly kept in mind. I know an actor who, without possessing a good memory in the ordinary sense of that term, always seems letter-perfect in his parts. His method of acquiring his part illustrates the natural memory I advocate for all.

Instead of contenting himself with his part, cut up, as usual, into the disconnected sentences which the cues of the other characters suggest, he procures the entire play, reads it over carefully, and gains a clear idea of the succession of events depicted therein. A natural association or broad outline of connected nature is thus suggested in the first place to his mind. Thereafter he studies his own part, and the detached sentences of which it consists, as that part remains in the entire book of the play. He thus strengthens the natural association of ideas which have been gained by his perusal of the entire play in the first instance. Then, having so far educated his mind in the complete production, he proceeds to con over his own detached part as usually supplied, and finds that the otherwise meaningless sentences of the 'cut part' have already set in his mind into a harmonious connection, easy of remembrance. This is only another illustration of the natural method of memory, practiced without the aids of links and associations other than those the subject in hand very naturally supplies."

These suggestions from Dr. Wilson we regard

as of the highest importance, and should be thoroughly mastered by the teacher who would teach successfully, and by the pupil who is endeavoring by self-culture to strengthen his memory.

A STRIKING EXAMPLE OF MEMORY CULTURE.

In my long acquaintance and friendly relations with Norton S. Townshend, M. D., now Professor of Practical Agriculture in the Ohio University, it had occurred to me I had rarely known a man with so good a memory. He seemed to have at the end of his tongue about everything that he had ever read or experienced. How did he come by such a memory? Was it a birthright, or had he trained it by years of discipline? This is the story he told me; it is full of interest and may serve as a stimulus to others:

“When I was about five years of age, I was thrown from a horse. Inflammation of the brain followed, and for many weeks convulsions were of frequent occurrence. There was

partial recovery after a time, but the memory remained seriously affected ; almost all knowledge previously acquired was lost, including the use of language, only two words being retained through and after the illness. When the general health was restored words were re-learned, and facts previously known were regained singly or in groups. For years afterward, however, the memory continued unreliable. When a lesson had been thoroughly learned at school, sometimes no part of it could be recalled when the time came for recitation. If sent upon an errand it was very often necessary for me after starting to go back and be told over again what was wanted. This weakness became not only troublesome, but very humiliating, and, finally, a fixed determination was formed to overcome this serious defect. The means adopted were as follow :

CLOSE ATTENTION.

“It was found that what was seen or heard in an easy, careless sort of a way was not retained, but when by an effort of will the attention was aroused and fixed upon whatever it was desirable to remember, and a distinct con-

ception obtained, there was then a good prospect of its being remembered. Gradually, as this fixing of the attention became habitual, it required less and less of effort.

CAREFUL OBSERVATION AND REFLECTION.

“In the acquisition of knowledge from personal observation, conversation or reading, it was often found necessary to deepen the impression by reflection. Questions something like these were silently asked: What is this? What is its name? What are its properties and uses? With what is it associated? What have I been told, and by whom? What have I been reading, and from what author? Such questions with their answers cleared up imperfect conceptions and left instead definite forms not apt to be forgotten. This plan also afforded a useful exercise in verbal expression. When the habit of uniting careful observation with reflection had become established it was comparatively easy, and greatly aided the memory.

METHODICAL ASSOCIATION.

“The linking of things together in the mind, so that when one member of a series is called

up the others will be at command, I found to great value. Association is said to be of three kinds: incidental, classified or methodical and artificial.

“Incidental association is seen where things are connected in the mind as they may have happened together in time or place, without regard to any intimate relationship. This casual or incidental association leaves our mental acquisitions in a promiscuous and ill-assorted condition; it was therefore as much as possible avoided.

“Methodical association is the orderly arrangement, or putting together of things which have some natural relation. As an illustration of such method, take a good business man’s office desk, where there are separate books for different kinds of entries, and special pigeon-holes for all classes of papers, so that anything can be found the instant it is wanted. This classifying or arranging of facts was secured from time to time by a few questions, such as, Here is a fact, to what is it related? What have I previously learned which belongs to the same subject? Or, Here is an incident, how can it be explained? What will it serve to.

illustrate? Questions asked in this manner and answered made it possible to store away all sorts of items so that they would be forthcoming when required.

“Artificial association was used for remembering isolated facts where no natural connection was evident. An example of this is the familiar acrostic, *v i b g y o r*, which so many employ to recall in their order the seven primary colors: violet, indigo, blue, green, yellow, orange and red. Another example is the association of facts about some center one which it is easy to remember. The date of the Great Fire in London is A. D. 1666; this is very easily remembered from the repetition of the figure 6. This date enables one to name the time of the Great Plague, which was the year previous; it also serves to indicate the beginning of fire insurance, which sprang like a phoenix from the ashes of the city. Other items may be clustered about the same date, as, for example, the year of the fire in London was that in which tea was introduced from China into England. There are many dates which might be associated with these facts were it necessary; I only mention a few by way of

illustration, the memory student can extend them to suit his own needs.

MENTAL EMPLOYMENT.

“Steady mental work had much to do with keeping not only the memory, but other faculties in working order. Teaching in Sunday-school, membership in a lyceum and other societies, required the constant use of whatever knowledge had been already gained, and compelled frequent resort to new sources of information. By such measures the memory was aided and strengthened greatly, and a laborious and successful professional life was made possible.

“My case affords evidence that by systematic and persistent effort a defective memory may be greatly improved; but, as will be noticed, this improvement was not secured by taxing, and still less by overtaxing, an enfeebled faculty. Its improvement was secured by close attention, repetition, careful observation, frequent reflection, methodical association and steady mental labor. Early in the effort I have described, two small books were purchased and thoroughly studied; these were The Improve-

ment of the Mind, by Watts, and The Intellectual Powers, by Abercrombie. The success obtained was, I now think, in large measure due to the valuable suggestions found therein.

“The pleasure which I have derived from the training of the memory, and, at the same time, the intellectual faculties, has been very great; but in addition it may be said that I do not see how it would have been possible for me to have followed the varied occupations of my life, that of an extensive farmer, a physician and surgeon, politician, college professor and lecturer had I not first restored my memory by careful training and discipline.”

MEMORY CULTURE IN SCHOOLS.

There are two methods used in schools for learning the lessons assigned to the pupils: one consists in having them commit every word of the lesson; the other is in having them master its chief contents, and allowing the pupil to give these in his own language. Both have value as means of strengthening the memory, and both should be assiduously cultivated if the

instruction is to produce its best effects. Committing to memory word by word, however, should never be carried to excess in early youth, and it should never be practiced to the exclusion of mastering the chief contents of a lesson, unless it is desirable to have the mind degenerate into a mere machine with no spontaneity and no originality. Besides, a pupil may learn a lesson by rote and be able to repeat every word of it, and yet have very little comprehension of its sense.

I will now give some hints for training the memory which may be useful in schools, and the same suggestions are also applicable to persons who have passed the period of student life.

Let the teacher give to his pupil any object with which he is well acquainted, some animal or an article of household furniture, for instance, and ask him to think over what he knows about it, out of school hours, and repeat it in his own way when there is a suitable opportunity. Or, better still, let him take a walk through some field or wood, where there are many objects of interest, with the idea in his mind that he is to remember and write

down or relate what has interested him most, to some one who is willing to listen to him. This not only exercises the memory, but also the faculties of observation.

Let the pupil frequently give, in words of his own, the chief points in some short, agreeable and instructive story.

The teacher must seek to impress on the mind of the pupil the exact meaning of all that he learns, so that it may be understood, and all the senses should be brought into exercise as much as possible; the greater the number of senses employed in observing any object the more firmly will it be held in the mind. Eyes, ears, touch, taste and smell communicate to the brain some special knowledge, and each has a memory of its own.

The teacher seeks to have unknown things and universal truths learned in connection with known things and truths; this helps to impress them more intelligibly on the brain and render them more easy to remember.

The teacher aims to impress on the pupil's mind useful knowledge. Important facts may be remembered by using them for writing lessons. They should be copied off from the

teacher's dictation into the pupil's copy-book.

The teacher endeavors to excite and please the mind while he at the same time cultivates the memory, well knowing that this faculty is strengthened best by agreeable impressions. This is done by relating important truths and principles to the pupil, with the instruction that he shall remember as much as he can.

At the conclusion of a lesson let the teacher call upon one of the pupils to give a brief synopsis of what has been gone over. This will help to impress firmly the whole subject on the minds of the other members of the class and answer the purpose of a review. The truths of religion and morality, and the rules of life should, on all appropriate occasions, be brought before the children in order that they may become fixed in their memories.

This kind of training, with special reference to strengthening the memory, need not, in the case of very young children, be carried to such an extent as to strain their little minds and injure their health. Memory lessons should be short and never, under any circumstances, over-tax the brain.

There are some things that must be learned

by heart; it will not do to give only a synopsis of the multiplication table. The rules of arithmetic, algebra and geometry must be committed to memory word by word with exactness; so must many other things taught in schools. The good teacher leads his pupils in this respect by pleasant paths if he would have them attain the objects sought by instruction. A few suggestions may help both teachers and pupils in this respect.

The teacher should endeavor to have the children trained quite early in committing to memory. This is a faculty which may be developed at a very young age. Indeed, after the power of perception the memory is the first faculty of the mind to be unfolded. The longer this mental power is neglected the more difficult it will be to develop it; on the other hand, the earlier it is brought into rational use the more easily will it become strong, the more readily will it hold in mind things to be remembered.

The first and most important rule is never to give too much to be committed at one time. Nothing is so much opposed to the true theory of education as to overload the faculties of a

child. It takes away all the pleasure of education; nothing is maintained thoroughly, and correctness is almost impossible when the lesson is too long.

The teacher should only give to the pupil what he can understand; or, at least, what he can understand when it has been properly explained. Only what is understood is grasped by the faculties of the mind and thus made useful; all else is so much mental rubbish.

Nearly all the youth in schools find it difficult to remember the names of countries, towns, rivers, mountain chains, population, etc. The teacher should recognize the fact that the youthful brain is not strong enough to master all such details, and he may wisely leave many of them to be acquired later in life, through the reading of newspapers and books. To master a difficult name without connecting it with an idea is an almost impossible thing to do; but it may often be made much easier by connecting a number of them together, and having them sung to some simple melody. For instance, the names of all the States of our own country, together with their respective capitals, may be thus easily committed to memory. In

like manner, the names of the counties of the State in which the pupils reside, with those of their county seats, may be learned with comparative ease. The same method will apply to the arranging of the names of the principal rivers of a country, with the bodies of water and the mountain ranges, thus at one and the same time cultivating the memory and the youthful voice, and furnishing for the pupils agreeable recreation.

It is important to choose the right matter to be committed to memory. The following are some of the things to be learned at the proper time: such rules of behavior, morality and worldly wisdom as all ought to know; the forms of all kinds of business letters and accounts; letters of thanks, apology and congratulation; letters of advice, power of attorney, contracts, proclamations, etc. Songs of patriotism are most easily learned, and will be more durably remembered if committed during school life. It will be well, however, to give the pupil considerable liberty to change the wording of many forms, as in too many cases they are much too formal. It is quite wonderful how this kind of knowledge becomes fixed

in the memory, even though there be unfrequent opportunity to use it.

The history of one's own country, at least the main facts of its history, should be acquired with exactness. In geography, one should know the boundaries of the different countries; the names of the important rivers, mountains and cities; the chief products, both animal, vegetable and mineral; the principal divisions of land and the chief geometrical forms may be learned also. The teacher should not forget to explain all these subjects so clearly that they will be readily understood; this makes committing to memory much easier and more effective.

The teacher should give his pupils suitable instruction as to how they should master a subject. It will be an advantage when giving this instruction to set them something to learn, asking them to commit to memory the first sentence thoroughly; then have them learn another sentence in the same way; when the sentences have been learned let both be repeated a few times. After this, let them take a third sentence, and when it is learned let it be repeated also, and so on till the whole

lesson is mastered. If the example be a poem, then let one verse be committed first, then another, and the second repeated, and so on till the last has been learned and that, too, can be correctly repeated. In learning a poem, each line should be thought of in connection with the one that follows, so that the first may suggest the second, the second the third, and so on, and each verse should be thought of in connection with the one that follows. In this way, after a little practice of association, everything becomes easy and natural.

The teacher should not forget that it is very important to have his pupils repeat in a very clear voice what has been learned, giving emphasis; inflection, due regard to punctuation and such other points as may be requisite to bring out the sense of the author in the best manner. By this method the pupil strengthens his memory and his voice at the same time, and also improves his elocutionary powers.

The teacher should impress it on the minds of his pupils that the value of a good memory cannot be over-estimated. He may mention the fact that nearly all great men have excellent memories, giving as an illustration the

case of William Cullen Bryant, of whom it has been said that he knew every one of his poems well, and could have reproduced them had they been destroyed.

The teacher should remember that the memory cannot be disciplined to advantage when the mind of his pupil is distracted by feelings, sensations and thoughts foreign to the subject of study. It may also be said that if a child is badly fed, insufficiently clothed, or suffering from some inward complaint; if the lungs and circulatory system be oppressed by the foul atmosphere of a crowded schoolroom; if the nervous energy be suppressed by imperfect oxidation of the blood; if the eye be deprived of the natural stimulus of a good light, the nostrils assailed by disagreeable odors, and the ears confused with an incessant tumult of noises; if one set of muscles be kept in a state of constant tension, and others in a state of abnormal relaxation by sitting in a constrained position hour after hour, a condition must be induced very unfavorable to the culture of memory.

The true method of education reverses all this. It consults the health and comfort of

the child; it saves the mind from the distractions and pain arising from bodily discomfort, and from the annoyance of scenes which sometimes prevail in schoolrooms, and gently directs the spontaneous movement of children's minds, rather than attempts to force them into movements repugnant to their best feelings, and quite as profitless as they are repugnant.

SELF-CULTURE OF THE MEMORY.

It is often the case that persons who have passed the age for attending school, or persons whose early advantages for study were limited, have a hungering and thirsting for knowledge, and a strong desire to improve their intellectual nature by taking advantage of such leisure as they may have at their disposal. The number of these persons is large, and notwithstanding our educational facilities, always must be. There is no more hopeful sign of human progress than that which we see in the efforts of individuals, busy much of the day with their vocations, spending their leisure in self-culture rather than in low social and con-

vivial pleasures. This class of students would make greater progress by first developing their memories so as to make their minds more retentive and capable of retaining any desirable mental acquirement. The perplexing and inexorable cares of daily life in some degree blunt the faculties for retaining knowledge, therefore they will need special culture to keep them in good condition.

I counsel such persons to begin by learning poetry so that it can be accurately repeated. The memory is strengthened more easily and quickly by this method than by learning prose. After a while easy prose sentences should be tried ; then lectures and discourses, and, finally, more difficult scientific works.

Every day, the student in this department of mental culture should master something which he can repeat correctly ; it may be very little, but let it be something. He may begin with a few words and increase his task, if only one line each day. In a short time it will become sufficient without any further increase, and make his daily lesson quite enough for his strength.

Committing to memory takes place most

rapidly when it is done in silence ; but if other thoughts press in on the brain, a low voice aids the student in holding his mind to its work. The two-fold mental action, that of hearing and speaking at the same time, assists to arouse the slumbering faculties, though the voice be only a whisper.

One should frequently test himself to see that that which he has gone over is really acquired or only comprehended, and that which has been lost should again be impressed on the mind.

It is not to be expected that in exercising the memory one shall have the time, or even be able to memorize everything ; but it is necessary to do this in the beginning, and always on a few things, and this is especially desirable for the young. Learning accurately every word is a very useful exercise for those who have weak memories.

It is important that the memory student understands thoroughly what he undertakes to retain in his mind. What is not understood is soon lost ; what is thoroughly understood is not easily forgotten.

The most suitable time to cultivate the memory is in the evening, when the light is low,

and the mind not readily drawn off by other thoughts, or in the early morning, soon after awakening, and after the morning bath, when the intellectual faculties are fresh. Cato and Cicero practiced on this plan and strengthened their memories by repeating, either in the evening or the following morning, the events of the preceding day.

The memory should be exercised at regular periods of time; but these periods should not be too far apart nor of too long duration, nor should they be too frequent. The danger in violating these rules is, that the mind becomes confused and the things to be remembered entangled one with another.

To remember a series of things most easily and correctly, they should be very carefully arranged in the mind, and their natural connection with each other be made as perfect as possible. In this way the one suggests the other, and the whole can be taken in, as it were, at one glance.

Things that are difficult to fix in the mind we may look at in connection with some external sign, as a line under the word or sentence, a note on the margin of the page, writ-

ten with a red, green or black pencil, and a special kind of fact associated with a particular color, and thought of in connection with it. Sometimes we may remember a difficult thing by picturing in the mind's eye the first letter, syllable or word, or, if there are several things, by connecting the first letter of each sentence into a word, or the first word into a sentence, and committing this to memory.

If one is to deliver an unwritten discourse in a strange place, it will make it easier for him to connect in his mind the different parts of his discourse with some of the more prominent features of the town or building, and, taking them in their order, proceed to the end.

If a recitation is to be made from any author, not only commit it to memory, but listen to it attentively as another reads it, and guard against making additions which may be suggested by the author's words, but are not his. This is a serious error, and one to which many well educated persons are prone. They read or hear some statement, and instead of repeating it correctly, mix their own thoughts with it and make a story the author would never recognize.

In committing to memory a poem, if one wishes to do it quickly, read each verse carefully over several times, and then endeavor to write it down correctly. If not successful in this, write down the first word of each line, or even the first letter, one under the other in order, and then repeat the whole verse, if need be, glancing at the first word or letter when the memory fails, and the whole will generally be suggested.

In copying anything from an author, it is advisable to read an entire sentence once carefully, and then hold all of it in the mind till it has been written down.

It is an excellent practice to make an abstract from any book being read, by taking notes of the most important facts and most beautiful passages, and then reading the abstract occasionally to impress it firmly on the mind. The beautiful passages of any book may sometimes be committed to memory with exactness, as an abstract is likely to be unsatisfactory. Of course one cannot commit many of these, but only those which seem to have the highest moral and spiritual beauty. In this way the student will be astonished

to learn into what a small space all that is really valuable in most of our books can be compressed. (In this connection read Prof. Townshend's letter in a previous chapter.)

MEMORY OF NAMES.

The memory of names is a subject with which most persons must have more than a passing interest. In our age of extensive travel we are constantly meeting people we have never met before. It is generally not only convenient but desirable to remember them, so we can speak their names on a second meeting, or even when we are relating to others whom we have seen.

The number of persons who never or rarely forget a name is exceedingly small; the number of those who have a poor memory for them is very large. The reason for this is partly a defect of mental development and partly a matter of habit. In either case it may be overcome by effort.

A name is, with few exceptions, an abstraction—it means nothing—and we rarely associ-

ate it with an idea until we know the person's business, or some of his traits and peculiarities. When we first hear a new name, our attention is so taken up with other matters: the face, the general appearance, what the person says, that the first impression may be indistinct and soon fade away.

Now, to make it an easy matter to remember a name, the first impression should be a vivid one. If we are introduced to a stranger, and wish to retain his name, we should insist on hearing it distinctly. Those who introduce people are often very careless in their articulation and pronunciation, and speak so low that only a vague impression is conveyed, and it may be well in such cases, where it would be no breach of etiquette, to ask for a repetition. If the first impression now is vivid, and the habit of attention has been cultivated, there will be little trouble. In order, however, to fortify the memory, it will be advisable to write new names in a book kept for the purpose, and after the day is over to repeat them a few times. When the book is opened the names may be read over again, and a second impression received. Each name may be

associated with the person's business, or some peculiarity, or the place and time of meeting; or if there has been no meeting, of how he became known to us. Not unfrequently, if we think of a person's business his name is at once suggested. I once tried to recall the name of a man I had met and could not till I remembered that he was a reporter, when the fact came quickly to mind that his name was Porter. Such a close resemblance between name and profession would, however, be extremely rare. On another occasion I tried to recall a name which had not been properly fixed, and could not until I began to repeat the letters of the alphabet. When I came to G, I felt sure this was the first letter, but what was the second? Then I pronounced Ga, Gau, and the whole name came to me at once. It was Gault. Some persons think they are greatly aided in remembering names by the simple act of writing them on a slip of paper, pronouncing them a few times and then throwing the paper away. This practice makes the impression a vivid one, and causes the attention to be thoroughly awakened by both eyes and ears, and is, no doubt, a most excellent one.

When it is desirable to hold in the mind a number of names in connection with each other, they may be arranged in alphabetical order and repeated a few times, with an occasional repetition after a day or two, when they will be found to be permanently fixed. Examples for practice may be had from lists of the various Government officials, as, for instance, the members of the cabinet of any administration, chief justices, the governors of States, the names of city or township officials, the names of the members of any boat club, or of the members of any society, school or church. A very pleasant evening study might be made in this way.

When the memory of names is defective, the person should make every possible effort to cultivate it by training and discipline. It is a form of mental weakness that is sometimes very annoying, especially to an otherwise cultivated and intelligent person. I have satisfied myself by experience and observation that a memory for names may be increased not only two, but a hundred fold; but this will not be accomplished by spasmodic effort. Long continued practice will be found necessary. After

a time it becomes so much a matter of habit that the effort is automatic, and the person does not think of it.

MEMORY OF FORMS AND FACES.

On this subject my esteemed friend, Mr. Edward Spring, the sculptor, at my special request, has furnished me with the following valuable suggestions :

WHY THE MEMORY OF FORM SHOULD BE TRAINED.

"We all have occasion for a better training in the memory of places and faces, in other words, of forms. The knowledge of astronomy, physical and political geography, topography, civil engineering, and familiarity with a neighborhood or a house, or recollection of the tools in a workshop, or of words upon a page to be learned by heart; all depend largely on the power of memory of places.

"Memory of faces notes the differences of shape between people. Facial expression is so entirely a question of form that the sculptor

possesses as great a range as does the painter in representing it.

“The man whose calling brings him into contact with the armies of peace or the armies of war must have a memory of the face and its name. Grant, like most great generals, was a brilliant exemplification of the commander’s memory. So in a bank, when one of thousands of customers appears at the official’s little window, he must be identified at a glance. The name alone or the face alone is not sufficient. But drill will associate them correctly, and often success or failure depend on this training. It is said that Louis Napoleon, whose memory of people was phenomenal, always wrote the name of a new person, and could then recall it, even though he had at once destroyed the writing. The value of this consists in receiving the impression through two senses instead of one—sight as well as hearing.

“Often much of the personal influence and power gained by hack politicians, and other dishonest schemers, is referable to expertness in memory of people. Shall we leave to the tyrants and the rogues a power with which every one has been endowed, but which yields

results only when fostered by a determined will, and when properly trained ?

EARLY TRAINING.

“Early training in kindergarten and industrial modeling and drawing is now acknowledged by leaders in education to be of great importance in mental development.

“The first and most difficult task of the teacher of drawing or painting is to teach the pupil to see correctly.

“If we look at a ball we can see only a hemisphere. What there is on the other side of that visible hemisphere we can only know by moving either the eye or the ball. So the cube has six faces, but we can only see three of them at a time. Thus with all other forms—we can only see a portion of each in reality, or in correct drawings or paintings. But the little child will attempt to draw the whole of a form exactly as it remembers it. How many times have we seen such instances as the house scrawled by the child, showing at once the front, back and both ends !

“But let the child first make a representation of the house or other object in blocks or clay

or pasteboard, and he will soon learn the requisite limitations of drawing, and can easily be shown how to use lines or tints to aid the memory or to express ideas, either by maps, elevation, section or perspective drawing. Indeed, children under ten often have a good sense of perspective. Later in life things are far more difficult which are as play to the little child.

“Fröbel’s plan of having the children in the kindergarten make balls, cylinders and cubes of clay is admirable. His exercise, that carries the ball through a series of changes by thumping it on the table in an orderly way, till the clay that was a ball becomes a cube, teaches the child by his own activity the control over matter, and, moreover, that the real thing sought is the ideal form realized by his effort. The material, he learns, is merely a help to express ball, cube or other mental conception of form. How essential it is to grasp this principle is known by those who have learned that ‘the letter killeth, but the spirit maketh alive.’ The modeling work was held by Fröbel to be rich in resource. It was not to stop with the kindergarten any more than the child’s growth would stop then.

“Every possible shape can be described in language as being like some one of the elementary geometrical forms, or as portions or combinations of those forms. These elements are few and easy to model in clay. They can also be cut in wood, made in pasteboard and in many other ways, or represented by working drawings and by perspective drawings.

“This work of the hands presents the most practical method of training the memory of form. Not only this, but a household familiarity with the names of these elements of form serve as language lessons and instruction toward geometry, arithmetic, physics, mechanics and a long list of ologies.

“The little child who has done some such educational work will very readily see that all spheres are of the same shape, whether seeds or suns; that all cylinders are of the same shape, though of different proportions. By whatever name the child may call the cylinder he will see the principle in a coin, a cheese, a telegraph pole or a hair. The point of the leaf-bud of the lilac, the top of the obelisk or the Great Pyramid are all of the same principle of form, and the cristalographer would describe

it as the 'half octohedron.' Of course a few scattering instances like these are as meaningless as words taken at random from a page; but the doing becomes of incalculable value while mere words are vain.

"I have had abundant verification that the question of size is no obstacle to the child's understanding of form. The elephant and the mouse are known at a glance by a young audience, though the mouse be made with many times more clay than the elephant.

"If training in morphology is important there is the greater need to secure and increase the instinct for it, which children otherwise will lose.

METHODS OF TRAINING.

"I should recommend much modeling and drawing of simple forms as 'memory practice.' Drawing, in fact, is always, we might say, from memory. If you were to place a small ball on the table and give to some children lumps of plastic clay, they could hold their hands under the table, out of sight, and make similar balls, almost as well as if watching the clay. That would be modeling from the object.

But if you ask anybody to draw a ball, or anything else, the only way is to first look at the object and then look away, and draw. If you look away a second, you use a short memory of the form. If you do not look at it for four seconds, your memory is four times as long. If you 'get an eye full,' and go into the next room to make your drawing, it becomes what is generally understood by 'memory sketching.' That the inventive teacher can prepare infinite varieties of exercises in this field has been demonstrated, and often the fresher they are the better—the brightness of the teacher finding response in the pupils.

"Already in some of our cities, noticably in St. Louis, Chicago, Boston, Philadelphia and Worcester, methods have been tried of exercising the hands and eyes of the pupils in the public schools, not only in drawing to make pictures, in fact little of that, but in using paper and pencil, clay and sticks, knives and scissors, in making forms that become a practical basis for orderly training of the memory of form.

"The Exhibition of Children's Work, held under the auspices of the Industrial Education

Association of New York, in April, 1866, showed that much can be done in the public schools as they are now.

“In order for our school children to be properly trained to appreciate the truths and beauties of the visible world, and all that appreciation means, modeling, drawing and painting lessons will not alone suffice. There must come in practice of fine differentiation, broader than the field of any one trade or calling—exercises that educate the faculties which are at the foundation of what all persons should know and enjoy. Let every child have the advantages that the blind person or the savage can have, added to those which our civilization should rightly give us.

“One of the most practical ways of training the memory of form is told of Houdon, whose wonderful exhibitions of sleight-of-hand the writer saw in Paris in 1847. Houdon and his son would pass a show window, and then compare lists of articles remembered, then pass again and add to their lists. At last they became so expert that, calling on a gentleman and waiting a few minutes in his library, they astounded him when ushered into his parlor

by their 'magic' in repeating the titles of his books.

"It is well to learn early that anything can be represented approximately on a flat surface, but that there may be a difference between one side of the shield and the other, and that if you draw you must only draw what you see. It is well to learn early that to understand the whole of an object one must have more than one view, or must take it for granted that the object is identical with known facts in its unseen parts. A simple profile likeness of a man who had lost one ear, would not be a complete portrait of the individual as known in life. If it showed one ear gone, he would be judged without any. If he showed one ear he would be supposed to have two. But, as a note for aiding the memory of the form, three written words would be quicker than a second drawing, and 'Right ear wanting,' under one profile view would be enough. Not for the little child, but for a constant dependence to grown people, is the art of writing, in remembering forms.

"In that remarkable book, Leonardo da Vinci's 'Treatise on Painting,' he says any one may draw a likeness from memory, by following this

recipe : Keep in the pocket a list of the possible forms of the parts of the face, arranged in order and numbered. Then compare the person you wish to remember with your list : nose, 4 ; eye, 7 ; mouth, 6 ; chin, 2, and so on, and by going away with the correct analysis you can reconstruct the likeness at any time.

“Few people have so good a general method of training, in this important power, the memory of form, as the artist has. But even the artist is apt to narrow his training to those features of his work that tend toward results in his special line, and may very possibly be all the more deficient in cognate lines not included in his narrowness.

“Deaf mutes have access to the visible and tangible world ; the blind have access to the audible and tangible world ; and much of everybody’s memory of form refers to the same range of impressions which a blind person can receive, by bodily contact. The curious experiment of rolling one marble with the crossed fingers and believing there are two, is an example of the force of memory of form by touch.

“Sir Charles Bell’s sixth sense, ‘the muscular sense,’ by which we estimate the degree of

effort employed, as, for instance, a blindfolded person holding two dishes would know when some one fills one dish, often explains to us the forms with which we come in contact. The memory of this is capable of wonderful development. All hand skill might, in fact, be referred to drilled memory of the changes of form which given tools can produce, and memory of the place for the tools. The touch and the 'muscular sense' are constantly employed in operations of skill, from music or sculpture to buttoning one's collar; and the limit of human skill, wonderful as that skill is, has never yet been reached.

MEMORY OF FACES.

"The great power of professional responsibility appears to be the most forceful incentive to the memory of anything, and official memory of faces is frequently astonishing, as in the cases of the bank teller, the city sexton, the director of labor, the hotel clerk, the police and other experts who must remember.

"But, as with more and better arrows in the quiver the warrior advances with a greater confidence, so a previous school training, such

as is mentioned above, might help even one of these experts. Not that he should model or draw each particular face, or even write out a category of its form, as suggested in the quotation above, from Leonardo da Vinci; but the sense that he had done so, and could again, joined with the duty and determination to remember, would strengthen even the strong. Fresh from modeling and drawing faces, I myself learned in a few days to call by name a hundred men when, as assistant foreman in the Central Park, I watched every morning at roll call as each man answered his name, with a mental effort to know him again.

“It has been a useful practice to make a list of the names of persons in a room, in their respective places—the place, the face and the name combining to help each other. If a few lines are also drawn to indicate some peculiarity of form, the aid to the memory is greater still. Such a list recalls in after years more than pages of writing alone. We might change the maxim and say: The price of memory is eternal vigilance.

“Dr. Abercrombie says, in his work entitled ‘Inquiries Concerning the Intellectual Powers,’

“In concluding this brief allusion to the subject of conception, I shall only add the following example of another application of this mental process. In the church of St. Peter at Cologne the altar-piece is a large and valuable picture by Rubens, representing the martyrdom of the apostle. This picture having been carried away by the French in 1805, to the great regret of the inhabitants, a painter of that city undertook to make a copy of it from recollection, and succeeded in doing so in such a manner that the most delicate tints of the original are preserved with the most minute accuracy. The original painting has now been restored, but the copy is preserved along with it; and even when they are rigidly compared, it is scarcely possible to distinguish one from the other. I am not aware that this remarkable anecdote has been recorded by any traveler; I am indebted for it to my friend Dr. Duncan, of the University of Edinburgh, who heard it on the spot in a late visit to the Continent, and saw both the pictures.”

“Another incident of artistic memory I remember as follows: The Carracci brothers were conversing with other artists and friends in the

Vatican, before the Laocoon group. Its praise was resounding loudly from all but the silent Ludovico. When, however, they rallied him for remaining so cold in the presence of such a marvel of art, he turned away from the marble, and with a few rapid touches made a striking sketch of it. Answering them, he said, 'The poet paints with words; the artist speaks by his work.'

"Hamlet looked at Ophelia's face 'as though he would draw it;' and that way of looking is a practical power for any to possess, and it is to be hoped that the education of the newer growth will continue to make these powers of the mind broader and deeper and higher."

MEMORY OF PLACES AND ITS CULTURE.

To remember places and their relation to other places and things is, with some, a gift, or more properly speaking, an instinct. Many animals possess it in a very high degree, the carrier pigeon being a remarkable illustration. Dogs, pigs and cats, among domestic animals, have this faculty very strong. Among insects,

bees are noted for their ability to find their way to their nests with great certainty from long distances. A swarm of humble bees has been taken nine miles from its nest, and nearly all of them found their way back again after having been kept in confinement over night.

The Indian has this instinct so strongly developed that he is said to be able to find his way in the trackless forest with ease, and is unable to understand why the white man cannot do the same. Many white men are no less gifted, though perhaps not exactly in the same manner; and especially is this the case with explorers, travelers, engineers, naturalists, geographers and great generals. But there are others in whom this faculty is very deficient. They cannot carry the points of the compass in their heads; they are always turned around when in a strange place; and lose their way easily. In such individuals, however, the memory of places may be cultivated and greatly strengthened. The following suggestions will be found useful:

- 1.—In going to a new and strange locality, fix the points of the compass well in mind first; this is very necessary.

2.—In going about the place, fix upon some central or conspicuous object as a point from which to locate the relations of all other objects. It may be the leading street, a tall church spire, a large building or a high hill.

3.—After the day is over, make an outline map of the regions visited, putting them all in their right relation to each other as regards points of the compass and distance. It does not matter how simple this map is; nor is it necessary that the person be skillful in the art of drawing. A very rude map, which any person can make in a few minutes, will answer every purpose; all unimportant matter may be omitted. It may be revised by the help of others familiar with the place, and occasionally studied so as to fix more thoroughly in the mind all its important features; or, if it is a large city, a map may be purchased which will be more satisfactory.

4.—If the place be in the country, all the finest features of the natural scenery should be associated with it. If there be a river or lake their location and size should be noted, with such particulars as may afterwards be useful. If there be any natural objects of interest, or

any relics or ruins they should all be included, and firmly fixed in the mind by the laws of association. Unless, however, the attention is carefully directed, there is danger of associating things together which do not belong to each other. This is most likely to be the case when many things are brought to the attention in quick succession before their right relation has been established.

Memory of places is not altogether an out-of-door matter, or one interesting only to the traveler. There is a relation between places and things to be cultivated also. We are obliged to remember where a thousand objects which we constantly use are; otherwise much time is lost in hunting for them. In our complex life it is hardly possible to remember where we put every little thing used; but the memory will be greatly aided by having a place for everything and keeping it there when not in use. This is not an easy habit to acquire, mainly because children are not well trained in it, but are allowed to leave their tools and playthings scattered about in the most irregular manner. So great a man as Benjamin Franklin had order as one of the virtues, and said: "Order, too,

with regard to places for things, I found extremely difficult to acquire. I had not been accustomed to method, and having an exceedingly good memory I was not sensible of the inconvenience attending want of system. This cost me so much painful attention, and my faults in it vexed me so much, and I made so little progress in amendment and had such frequent relapses, that I was almost ready to give up the attempt and content myself with a faulty character in this respect. In truth, I found myself incorrigible with respect to order; and now I am grown old, and my memory bad, I feel very sensibly the want of it."

In addition to forming habits of order when we put anything away, it will save the memory considerable strain if we impress the place firmly on the mind. After a while this will become easy to do, and we can do it without thinking.

The memory for places may be strengthened when reading by trying to remember in what book certain facts or passages are to be found, and also the page in the book. It would, however, be a waste of time to try to remember unimportant and trivial things which have no

interest or value. By such a course the mind is weakened and injured. The brain is too important an organ to be used as a storehouse for painful impressions or worthless facts and experiences; these should, if possible, be forgotten.

CULTURE OF THE MUSICAL MEMORY.

The musical memory does not seem to have been discussed philosophically. Music is acquired primarily through the sense of hearing, and the memory of sounds is located in an entirely different part of the brain from the memory of form and color. But as we use the sense of sight as well as hearing in acquiring a knowledge of music, there must be a connection between the two brain regions concerned in seeing and hearing.

The muscular sense has a very close relation to the musical memory. After a piece has been played a certain number of times on a violin, piano, or other musical instrument, the hands and fingers become so trained to make the right moves that they can hardly make any

other. This, however, is only the case when the discipline has been very thorough. If it has not been thorough, then there may be doubt as to which move to make, and this would constitute a lapse of memory.

In learning to sing or play by note, the eyes are used constantly to suggest the chord to be sounded or the key to be touched ; and as there must be accuracy to prevent discord, most musicians keep their notes constantly before them to refresh and aid their memories. This is right in learning any piece. Those who learn by ear, as many do, can never play so accurately as those who learn by note. Even Blind Tom, whose musical memory is prodigious, makes mistakes. Of the thousands of men and women who have so much musical talent as to be able to play and sing in church and concert, and for their own and their friends' pleasure, a majority are helpless unless their books are before them. Their musical memories have not been cultivated so as to make them independent of the notes. While I write these words an English musician is being severely blamed because he attempted to play in a concerted piece from memory, and suffered a complete loss of it in the midst of the

performance. A performer, however, who cannot abandon his book and throw his whole soul into his work can never be a great artist. If he follows the book with his eyes his attention is taken from his work, and it becomes more mechanical and less an inspiration. One great musician has said: "When I play from memory I am myself; when I play from the book I am some one else."

Even with the greatest masters the musical memory sometimes plays fantastic tricks. Any unusual excitement and worry, any little mistake in gesture, or some disturbing incident is liable to break up the chain of orderly procedure and cause a loss of the musical memory. And, yet, were these lapses twice as frequent as they are, I should urge every musician to become such a master of his divine art as to be able to throw away his book, and put all his soul into his performance.

The only methods I have to advise for securing this musical memory are *self-confidence*, *determination* and *practice*.

I have consulted a number of excellent teachers on this subject, and they all inform me that there is no royal road. Some of them state

that they insist that their pupils shall learn every piece so that they can play or sing it without their books; but they always give them a reasonable time to do it, and never regard any composition as mastered till this is done.

STRENGTHENING THE MEMORY FOR FACTS AND EVENTS.

The memory of politicians is generally excellent, and, no doubt, often becomes so by the special training which their lives furnish. A most interesting and suggestive case is that of Thurlow Weed. Being interviewed and asked to tell a friend what method he had adopted to strengthen this faculty, he replied: "When a young man, I had to adopt a regular method for strengthening my memory, and I hit on one that was very effective. I will tell you all about it for the benefit of other young men. I got married in 1818, when I was working in Albany as a journeyman printer. In a few months I went into business, establishing a newspaper for myself, and some of my friends

thought I would succeed in politics, probably because I impressed my views strongly on those about me. But I saw at once that I had a fatal weakness which I thought would prevent it. My memory was a sieve. I could remember nothing. Dates, names, appointments, faces—everything escaped me. I said to my wife, ‘Catherine, I shall never make a successful politician, for I cannot remember, and that is a prime necessity of politicians. A politician who sees a man once should remember him forever.’ My wife told me I must train my memory. So when I came home that night I sat down alone and spent fifteen minutes trying silently to recall with accuracy the principal events of the day. I could remember but little at first; now I remember that I could not then recall what I had for breakfast. After a few days’ practice I found I could recall more. Events came back to me more minutely, more accurately and more vividly than at first. After a fortnight or so of this, Catherine said, ‘Why don’t you relate to me the events of the day instead of recalling them to yourself? It would be interesting, and my interest in it would be a stimulus to you.’ Having great

respect for my wife's opinion, I began a habit of oral confession, as it were, which was continued for almost fifty years. Every night, the last thing before retiring, I told her everything I could remember that had happened to me or about me during the day. I generally recalled the very dishes I had had for breakfast, dinner and tea; the people I had seen and what they had said; the editorials I had written for my paper, giving her a brief abstract of them; I mentioned all the letters I had sent and received, and the very language used, as nearly as possible; when I had walked or ridden—I told her everything that had come within my observation. I found I could say my lessons better and better every year, and instead of the practice growing irksome, it became a pleasure to go over again the events of the day. I am indebted to this discipline for a memory of somewhat unusual tenacity, and I recommend the practice to all who wish to store up facts, or expect to have much to do with influencing men."

Judge Ranney, M. C., and formerly Speaker of the House of Representatives, aids his memory in a different way. When he is looking up

a case and reading the papers in it, he notices nothing going on around him; when he comes to a fact which he wants to remember he writes it down on a slip of paper. He does not keep the slip or pay any further attention to it. The writing of it down fixes it as indelibly in his mind as though he had stencilled it upon his brain. After he has been reading through the different parts of the House one may find his footprints in the notes of memoranda on the members' desk at which he has been sitting. He makes notes in all sorts of places and always leaves them untouched.

MEMORY FOR FIGURES AND DATES.

The memory for figures is, with some persons, natural and easy; with others it is very difficult. The former do not need to strengthen their memories in this respect so much as to discipline them, that their energies be spent only on what is important, and not wasted on what is trivial. They generally excel in mathematics, and as engineers, surveyors, or book-keepers and accountants, or, if they have not

been educated, their natural memories serve them exceedingly well, and they are able to carry accounts in their head, even if numerous and complicated.

The latter class need special training for the development of the memory of figures, and I know of nothing so useful for them as the study of mathematics. This may seem to many as impracticable, but I do not think so. It is not necessary to go into the study of the higher mathematics; the study of mental arithmetic and of the first principles of algebra and geometry are quite sufficient. The rudimentary books designed for beginners, where everything is so simplified as to be perfectly easy and plain, are the best. A leisure hour given to them every day, or even every other day, will not only strengthen the memory of figures but form a most excellent means of disciplining the mind.

In addition to this, the faculties should be exercised daily in recalling such matters as involve figures. The amounts of money spent daily for trifles or for important purchases may be written down at night from recollection. The prices for all articles in daily use in mar-

ket may be held in the memory as a matter of mental gymnastics. If a note is given or taken, the amount of it, the time it was given and the date of its maturity, together with the rate of interest, can be held in mind with little difficulty. The number of the street on which a friend lives; the number of the postoffice box at which he receives his letters; the number of apple, peach and pear trees in your orchard, if you are so fortunate as to have one, and the number of bushels of fruit they produce yearly, together with the money for which they were sold may be used as memory lessons. The indebtedness of each State and of the various governments are also suitable subjects on which to exercise the memory for figures, and so are the times of the revolution on their axes and in their orbits of each planet, and the distances of each from the sun and from the earth.

It would be a mistake, however, to load the mind with too much at first; a little each day is quite enough. If attention is paid to the subject and the pupil does not falter after a short trial, it is interesting to notice how retentive the memory for figures will at last become. Here, however, as elsewhere, the im-

portance of determination and a vivid first impression are necessary. It is carelessness and want of attention that causes so many to have weak and debilitated memories, not only for figures, but for names, dates and facts.

THE FIGURE ALPHABET.

Numbers have from a very early time been indicated by some of the letters of the alphabet. More recently the figure alphabet has been used in every system of mnemonics, and by it the most extended series of numbers can be recalled at any moment; but the machinery of the figure alphabet is so complicated and cumbrous that it will never be extensively adopted.

The following is the figure alphabet as used by modern teachers of mnemonics:

1	2	3	4	5	6	7	8	9	0
t	n	m	r	l	sh	g hard	f	b	s
d					j	k	v	p	z
					ch	c hard			c soft
					g soft	ng			

The vowels are never used in the figure alphabet, nor any other consonants. All silent letters are omitted, and if two consonants come together in a word with no letter between them they are regarded as one. To illustrate: $f = 8$; ff , however, would not be $8\ 8$, but also 8 . Where some other letters are used which have the same sound as the consonant they have the same value. For instance, in the word phosphorus the ph has the sound of f , and, therefore, $= 8$. The pupil must be very careful, for this reason, to see if the consonants in a word have their proper sounds before using them. To gain familiarity with the figure alphabet the pupil should take a spelling-book or dictionary and convert the letters of a large number of words into figures, as follows: Nile, $2\ 5$; Victoria, $8\ 7\ 1\ 4$; name, $2\ 3$; fish, $8\ 6$; man, $3\ 2$; hour, 4 . In the word Victoria, it will be seen that the c has the sound of k , and so $= 7$. In the word hour, only the r has any value, and that $= 4$. The figure alphabet may be learned in a single lesson, but it requires practice to fix it in the mind, and this can be had best by converting whole pages of words into figures, and also by using it when opportunity offers.

I urge my readers, however, against the folly of using it to the exclusion of more natural methods and rules inculcated on every page.

The practical use of the figure alphabet, as illustrated by most teachers of mnemonics, is so absurd that I will not go into any details concerning it. I think it can only be used to the injury of the mind. It may, however, have a limited value. Suppose, for instance, you wish to remember the length of the Ohio River, which is, say, 1,213 miles long, you have simply to choose a word, phrase or sentence which will contain in regular order the letters representing these figures, and remember this word, phrase or sentence in connection with the Ohio River. The phrase *at no time* contains the correct numerals. In order to fix them in the mind it will be necessary to repeat them together a number of times, so that when you think of the Ohio River you will also think of the phrase, *at no time*. Pupils preparing for an examination may find this useful. The height of mountains, the length of rivers, the population of countries, and many other things can be remembered in this way, providing the pupil can find suitable words containing the

letters to represent the figures. The figure alphabet may also be used to call the specific gravities of bodies, and, indeed, there is no end to its application; but I have found in practice that it really costs as much as it is worth. One who uses it, except where it comes in naturally, only litters the mind with methods of little or no value.

TRICKS OF MEMORY.

The figure alphabet for tricks of memory may, however, be found to serve a useful purpose. The knight's tour is an illustration of it. The chessboard contains 64 squares. The knight's tour consists in placing the knight on the first square and making him go through all the other squares, only making legitimate moves, and never going over the same squares twice. It is said to have cost an eminent mathematician years of study to discover the correct order of moves. It is as follows: 1, 11, 5, 15, 32, 47, 64, 54, 60, 50, 35, 41, 26, 9, 3, 13, 7, 24, 39, 56, 62, 45, 30, 20, 37, 22, 28, 38, 21, 36, 19, 25, 10, 4, 14, 8, 23, 40, 55, 61, 51, 57, 42, 59,

53, 63, 48, 31, 16, 6, 12, 2, 17, 34, 49, 43, 58, 52, 46, 29, 44, 27, 33, 18, 1.

Any one who will take the trouble to draw on a piece of paper an outline chessboard, place the numbers, 1, 2, 3, 4, etc., in the square, from the left to the right to the last one, and then draw a straight line from the center of square 1 to the center of square 11, from here to 5, and so on in the order of the figures given above, until he has returned to square 1 again, will be surprised at the picture his outline chessboard exhibits. I will not give a list of words representing the letters for the figures for the knight's tour, but leave it for each pupil to do this himself. I will only hint that the first word should be one in which there is a letter to represent the figure 1, as, for instance, the word *hot*, and no other additional figure; the second, 11, and so on. When the list of words has been selected and written down in their order, they should be committed to memory exactly as they stand. If this is not done, the experiment will be a failure. When once mastered, one may entertain his friends by making the tour from memory, simply converting the letters in each word

as they come one after another, back into figures. Beyond being a mere trick of the memory, however, I do not regard this feat as of any value, and am surprised at the attention teachers of mnemonics bestow on it.

I could give a hundred other tricks of the memory, but I refrain, as the object of this work is to teach the pupil how to cultivate the faculty of recollection in a perfectly natural manner.

HOW TO LEARN A NEW LANGUAGE.

In 1860, Dr. Edward Pick created a profound impression in England, France and Germany by his lectures on "Memory and a Rational Means of Improving It." In 1862 he published a revised edition of a little work on the subject, which contains many valuable ideas, the most important of which I shall now reprint. They will be found of special use to all students of languages. He begins by saying that

"The surest and most effectual way to ensure an easy and accurate reproduction of ideas is to deal with the first impression; that is to say, to impart to it strength and vivacity. If this

be done, the process of reproduction will accomplish itself with little or no effort. Now, experience teaches us that it is quite in our own power to greatly strengthen the original impressions. One of the most familiar modes, and one of those most in use, is ATTENTION. It need scarcely be remarked, that if attention has been paid to any object or subject the mind will receive a more powerful original impression than if we had been absent or inattentive.

ASSOCIATION OF IDEAS. a. ANALOGOUS OR OPPOSITE.

“The consideration next arises as to the most effectual means of forcing or fixing our attention, so as to produce a vivid and strong impression. Such means will be found to consist in COMPARISON.

“With respect to comparison itself, a few explanatory remarks may be useful. We can only compare those ideas with one another which have some connection, that is to say, analogous or opposite ideas. When we thus compare two ideas, we search out and place side by side the qualittes which they possess in common, and those on the other hand, by

which they are distinguished from each other. Now, this operation involves an effort of the mind, and produces an attention which inevitably strengthens the impression. And if at a subsequent period either one of the two ideas which have thus been compared and analysed presents itself to the mind, it will recall the other immediately and distinctly.

“From this it follows, that if there be two ideas which have any relation or analogy with each other, and which it is desired to retain in the mind, it is only necessary to compare them. The attention required by this act of comparison is sufficient to ensure their mutual and almost simultaneous reproduction; inasmuch as when one presents itself it will recall the other.

“Now, if there be a series of such analogous or opposite ideas, which it is desired to retain by heart, the rule just described still holds good, and the task will be found easy if set about with care and deliberation. We shall here merely compare the first idea with the second, the second with the third, and so on; no more than two ideas, however, being taken up at the same time, without paying any attention to the preceding or the succeeding ideas.

This rule must be rigidly attended to, in order to avoid confusion and perplexity. By this means the operation will always continue simple; there will be always two ideas, and only two, to compare at one and the same time, notwithstanding the length and number of the whole series. The reproduction of the whole is, therefore, the more certain; while, at the same time, the first idea will recall but the second, the second but the third, the third only the fourth, and so on in the consecutive series throughout. Thus none will fail, and the ideas will occur in order whenever it is desired to recall them.

EXAMPLE.

“As an example and practical illustration of the foregoing remarks, and a test of the mode of mental exercise suggested, we may compare the following ideas; but we must take care to confine our attention, from step to step, to the two ideas which we have to compare, without paying attention at the time either to those which precede or those which follow them.

England	.	.	.	.	navigation
navigation	.	.	.	.	steam

steam	railway
railway	telegraph
telegraph	electricity
electricity	thunder
thunder	storm
storm	blow
blow	windpipe
windpipe	pipe
pipe	music
music	harmony
harmony	alliance
alliance	peace
peace	tranquility
tranquility	silence
silence	meditation
meditation	faith
faith	honesty
honesty	merchant
merchant	India
India	hot
hot	summer
summer	vegetation
vegetation	rock
rock	mountain
mountain	Switzerland
Switzerland	travel

“Here, then, is a chain of ideas to be associated link by link so as to be capable of being recalled to the mind whenever it is desired to

do so. Now, if we have taken care, in going through the list, always to compare only two ideas together, or at the same time, without for the moment paying any attention to the rest, the reader is requested to try whether he knows the list sufficiently well to go through it in the above order. If he has paid sufficient attention to, and distinctly understood, the simple principle and method of practice which has been laid down, he will be able to do so. When the first word or idea is taken, it will immediately reproduce the second, the second will reproduce the third, and so on, with astonishing facility, through the series, which, with diligence and intelligence, may be extended to almost any length. But this is not all. Not only can all the ideas be recalled by going on consecutively from the beginning; but if any one of them be taken, all the others can be recalled when one has adequate experience in this practical system of mnemonics. Again, if, instead of beginning with the first word, the student begins with the last, and thus proceeds inversely, he will find that he can remember and recite the words or ideas with equal facility. The cause of this facility and certainty of result is, that

no more than two words have been compared in the mind at the same moment. And thus, as the first can only recall the second, and the second the third, and so on, none can fail. And again inversely, the thirtieth will recall the twenty-ninth, the twenty-ninth will recall the twenty-eighth, until all the ideas have been recalled.

“We cannot too strongly insist on the importance of completely isolating each couple of ideas at the moment of comparing them, and confining our attention solely to them until the comparison be made throughout the series. An essential advantage of such isolation is, that it prevents obscurity and perplexity; the mind is not overloaded, because the difficulty of the task does not increase with the number of ideas, there never being more than two to compare at one and the same moment.

“A very usual recommendation made by some writers on mnemonics is to learn a series of words by heart, or commit them to memory, by combining them together. But it should be considered that a combination of this kind is effected, not by reflection, but by imagination, which is a very different thing. To take an ex-

ample. This process of combining ideas by imagination, applied to the foregoing series, would take place in this way: England is the country of navigation, which is performed by the aid of steam; steam impels locomotives upon railways, which railways possess telegraphs, which telegraphs are worked by electricity, etc., etc. But this mode of combining ideas can never perfectly attain the desired result, because it contains the inherent defect of there being no intrinsic necessity or certainty that the primitive impression is strengthened; whilst, on the contrary, in a simple isolated comparison of two ideas, there is a complete certainty of that effect being produced. Moreover, in this process of imaginary combination, the more ideas there are to be combined the more difficult and confused becomes the task; which objection is not applicable to the system of comparing, by reflection, two isolated ideas at a time before passing to any further comparison.

ASSOCIATION OF IDEAS. *b.* NEITHER ANALOGOUS
NOR OPPOSITE.

“When we desire to retain or to insure the power of recalling two ideas which are neither

analogous nor opposite, we find that they cannot be combined directly. But the object can be accomplished in an indirect manner.

“This will be readily apparent. Each idea has some relation with a great number of other ideas. We must look amongst the ideas connected with those two which we desire to retain, for the purpose of finding points of comparison. For example: If we have to compare or combine *paper* and *youth*, we must look for one or more ideas which by their insertion will establish a chain of relative or connecting ideas between the two which are to be combined. This process is, in some respects, an arbitrary one; and each particular person will establish his own chain of connecting links, according to his tastes or experience. Thus, one will say that *paper* can be compared with *white color*, this with *pure*, and pure with *youth*. Another will work out the combination in this way: paper—engine—force—youth. Another will compare: paper—book—imagination—youth. Thus the process of combination will vary with different persons; but in every case the comparison will be found easy; and such comparison once established, the idea of *paper* will, by means of

either of those processes of thought so gone through, always recall that of *youth*. There are different ideas, which have been so often present together in the mind, that they recall each other instantly, *e. g.*, *steam* and *boat*, *boy* and *man*, *black* and *white*, *light* and *dark*, etc. In these cases no intermediate ideas are required.

“By this means a combination, sufficient to insure the power of recalling any two given ideas only one being presented to the mind, can always be obtained. It is, no doubt, desirable that the combination of two different ideas should be made by only one, but, at all events, by as few intermediate ideas as possible. Yet the number of these intermediate combining ideas does not materially prejudice the facility of their reproduction, which, indeed, often takes place with such rapidity that we are scarcely conscious of the presence or nature of the intermediate idea, so quickly does it come upon us. This is especially the case with ideas which are familiar to us.

“As an illustration of these remarks, let us suppose that we are to retain the following series of ideas: Garden, hair, watchman, phi-

losophy, copper, cloth, workman, apple, eclipse, dream, coal, balloon, microscope, idleness, silk, fountain, coast, watch, snow, etc.

“We can combine the ideas in this manner: *Garden*, plant, hair of plant—*hair*; *hair*, bonnet, *watchman*;—*watchman*, wake, study—*philosophy*; *philosophy*, chemistry—*copper*; *copper*, cover—*cloth*; *cloth*, tailor—*workman*; *workman*, gardener, garden—*apple*; *apple*, earth or moon—*eclipse*; *eclipse* dark, night—*dream*; *dream*, nightmare, suffocation—*coal*; *coal*, gas—*balloon*; *balloon*, distance—*microscope*; *microscope*, study, labor—*idleness*; *idleness*, hot, thirst—*fountain*; *fountain*, dying—*silk*; *silk*, China, sea—*coast*; *coast*, navigation, compass—*watch*; *watch*, Switzerland—snow, etc.

“Thus, by the exercise of ordinary ingenuity and attention (in itself a beneficial mental exercise), combinations can be effected to any extent.

APPLICATION OF THE ABOVE RULES.

“The process of the mental operation just described for the reproduction of a series, or of several series of ideas, can be applied in every case, where any series of words are to be re-

tained in the memory ; and the object can be accomplished, with certain differences of detail, according to different circumstances. For instance : In some cases it is necessary to know and retain a series of words in precisely the same order in which they were given ; in other cases, the order of the words is not of essential importance.

“ In natural history, where there are particular and distinct classification of animals, plants and other objects, it is necessary to observe the order of the words as given ; but there are many cases in which it is not so necessary.

“ In cases of the latter kind, what we have to do is to arrange the ideas ourselves, so as always to combine and take together those ideas which have any relation to each other, and which, consequently, can be compared directly.

“ To make this remark clear, it will be advisable to look over any ordinary grammar—the French grammar, for instance. In the grammar, under a general rule, we often find a series of words forming an exception to the rule, and which it is required to retain in the memory. Here it is, of course, essential to know all the words forming the exception ; but

the *order* in which they are given is of no importance.

“Sometimes the exceptional words or deviations from the rule are arranged in verses, and sometimes in alphabetical order ; these arrangements being adopted for the purpose of aiding their retention by the memory.

“Now, if instead of adopting the metrical or alphabetical plan, we arrange the series so as to call in reflection, *i. e.*, so as to take together the words and ideas which have any natural relation, it will be found that they will become perfectly familiar, and that the mind will retain them after only two or three attentive perusals.

“The French irregular verbs, for instance, with their English significations, are given in the French grammar as follow :

acquérir, <i>to acquire.</i>	coudre, <i>to sew.</i>
aller, <i>to go.</i>	courir, <i>to run.</i>
s'en aller, <i>to go away.</i>	croire, <i>to believe.</i>
s'asseoir, <i>to sit down.</i>	cueillir, <i>to gather.</i>
battre, <i>to beat.</i>	dire, <i>to say.</i>
boire, <i>to drink.</i>	écrire, <i>to write.</i>
bouillir, <i>to boil.</i>	envoyer, <i>to send.</i>
conclure, <i>to conclude.</i>	fuir, <i>to shun.</i>
confire, <i>to pickle.</i>	haïr, <i>to hate.</i>

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lire, *to read.*
 mettre, *to put.*
 mouire, *to grind.*
 mourir, *to die.*
 mouvoir, *to move.*
 naître, *to be born.*
 ouvrir, *to open.*
 plaire, *to please.*
 pouvoir, *to be able.*
 prendre, *to take.*
 revêtir, *to bestow.*
 résoudre, *to dissolve.*

rire, *to laugh.*
 rompre, *to break.*
 savoir, *to know.*
 suivre, *to follow.*
 traire, *to milk.*
 tressaillir, *to startle.*
 vaincre, *to vanquish.*
 valoir, *to be worth.*
 vivre, *to live.*
 voir, *to see.*
 vouloir, *to be willing.*

“Now the object of the scholar, in reference to the above words, is to be able always to recognize them as exceptions to the general rule, and to do this without reference to the order in which they occur. For this purpose, we have but to select sets of two words bearing analogy with each other, and to compare, viz.,

sew	with	sit down.
sit down	“	move
move	“	go
go	“	go away
go away	“	send
send	“	follow
follow	“	run
run	“	shun
shun	“	break

break	with	open
open	“	put
put	“	bestow
bestow	“	take
take	“	acquire
acquire	“	vanquish
vanquish	“	beat
beat	“	startle
startle	“	die
die	“	live
live	“	be born
be born	“	laugh
laugh	“	please
please	“	hate
hate	“	say (calumny)
say	“	read
read	“	write
write	“	see
see	“	be able
be able	“	know
know	“	conclude
conclude	“	be willing
be willing	“	believe
believe	“	be worth
be worth	“	gather
gather	“	drink
drink	“	milk
milk	“	boil
boil	“	pickle
pickle	“	dissolve

“Now if this series of words be studied in the manner which we have recommended, and of which the list last given furnishes an example, namely, by comparing, or bringing before the mind at the same time, only two words, and these the ones which have a definite affinity, one or two attentive perusals will suffice to fix them in the mind for ever. But if an attempt is made to learn such a series by heart in the ordinary mode, that is to say, by repeating it over and over, without any reference to analogy, until by such repetition it remains in the mind, not only will vastly longer time be expended in the task, but the great probability is, that the whole of them will never be known perfectly, for there is no principle of connection. And should occasion arise to make use of any one of the words, it will often be necessary to repeat the whole list in order to ascertain whether the particular word needed be amongst the exceptions. This is a great difficulty and discouragement to students. But if the task of retaining or committing the words to the mind has been effected in the manner indicated in the example, not only is their reproduction or recall at any future time rendered more cer-

tain, but on any one of the words or ideas occurring, it will immediately recall the others; and there can be no doubt or uncertainty; for if a given word is not comprised in a series (as of the exceptional words just cited), it is at once known that it is not amenable to the observations which apply to that series; for instance, in the particular example given, that it does not form one of the exceptions to the general rule.

“It is here presumed that the meaning of the French words is known, or, in other words, that they are ideas available to the reader. Words belonging to foreign languages not known to us, or, indeed, any words of which we do not know the meaning, are, of course, no more than mere sounds, so far as we are concerned.

“If a series of words has to be retained in the order in which they are presented, that is to say, if we cannot group together those words which have a connection, then we have only to compare the first with the second, the second with the third, without any further regard to the first, and so on. The comparison will be made directly where any connection exists, in-

directly where different ideas are given, according to the above rules."

WORD MEMORY.

At my request Prof. J. D. Gaillard, the eminent teacher of languages, has given some valuable hints upon the acquisition of word memory. He writes:

It is of primary importance for the thinker, the philosopher, and even the conversationalist to have always at hand a large number of words with which to express his thoughts, and never to be at a loss for the proper expression of his ideas.

The study of a copious vocabulary ought, therefore, to form an integral and important part of the education of the young. But is this special study necessary, and cannot every one of us find out and assimilate the words we want for our own use by reading good books? Every one of us reads more or less, and yet how few have the command of a large and well-chosen vocabulary. It is true to say that great writers and gifted orators have always

had a perfect command of words without having made any special efforts to acquire them; they have probably gathered them almost unconsciously in their intercourse with superior minds, or in reading their favorite books. But these are exceptional cases, because genius is not subject to ordinary laws. Men of average capacity are not so prompt in their assimilation of words, and need help, discipline and method for the training of their memories of words. Besides, their ideas are more or less limited, and every new word they acquire brings with it a new idea, and necessarily increases their mental powers, being, in fact, a new seed which will bring forth fruit in due time.

If we admit the usefulness of a large vocabulary for speaking or writing with power our mother tongue, we must consider it a most indispensable acquisition, and one of primary importance for the study of a foreign language; and if we can find a means of alleviating this otherwise arduous task, it would be most valuable to the student. But the question arises: Is it possible, without straining the memory and without monotonous labor, to lay to heart and to completely assimilate a large number of

words which may always be readily found to express our thoughts and ideas ?

This work will become an easy and pleasant pastime by the application of the following principles :

1.—By making the subject matter interesting and instructive.

2.—By establishing a powerful and logical link between the words we desire to commit to memory.

If the attention and interest are gained by the introduction of scientific, artistic and even romantic subjects, and the chain or group of ideas is naturally associated in the mind, the words which denote them quickly follow the same law, and fix themselves in the memory with a surprising rapidity, producing such a strong impression, both by the scenes described and the close association of the words employed, that there is a good chance they will never be forgotten.

It is evident that if the mental pictures are lively and graphic, they will almost unconsciously recall to mind the words of which they are formed. But the words themselves should first be learned, and here we must see if psy-

chology affords us a hint towards lightening this grievous task. It does, in that natural connection in the mind of the ideas of things in themselves related to one another, whereby one of these related ideas calls up to our consciousness others of them, with an ease and quickness proportioned to the strength and closeness of this connection; in short, one of these related ideas tends to suggest the other almost unconsciously, at any rate, without mental effort. This is the doctrine of association of ideas.

As ideas are to the human mind the symbols of things, so words are to it the symbols of ideas; and it follows that words suggesting associated ideas will, in like manner, tend to suggest each other with a quickness and ease proportionate to the tenacity with which the ideas themselves may become associated in the mind. Further, it is a cardinal point of the doctrine that the association of certain words may, by repetition of this connected order, soon acquire a strong hold on the mind as the symbol of the ideas which they denote.

We can compare the ideas which we form of internal objects to a number of bells of a

sensitive metal, hanging on a wire. If we ring any one of them there arises a vibration of the one next to it (or the two between which it is placed), and this influences the next, and so on to the end, the vibration gaining strength and vigor in proportion to the frequency and power which the bells have been rung together.

On these principles, then, the vocabularies which I have compiled are constructed; each representing one or more scenes in the life of an individual. Thus, in describing the beauty and harmony of nature—the human body and its movements—we take the first man created, and place him walking in ecstasy among the splendors of the material world, and the dazzling, luxuriant, fruitful, earthly paradise in which he finds himself. The words denoting those portions of the structure of the human body, which intelligent people ought to understand, are given in the form of a lecture by an old professor of anatomy, who explains to his audience the circulation of the blood, digestion, etc., having first wiped his spectacles, tapped his snuffbox, and taken a pinch. You naturally smile at the introduction of such apparently trivial ideas as these; but I can tell you the

want of French words to express common ideas may sometimes make you feel very foolish when you are supposed to understand the language.

Then for the words connected with cooking, eating, drinking, etc., the student cannot well forget them when he has fixed in his mind the history of an unfortunate corpulent cook, whom he has followed in all his culinary operations, and who tears his hair and sheds bitter tears because he has seen the clumsy scullion upsetting his dishes and spoiling his sweetmeats.

For the words connected with business, they are strung together in the description of a counting-house, and the names of the chief goods exported from England and imported from the Colonies are given in the description of the loading of a ship at Liverpool, which the learner will follow in her voyage round the world, and see her return and discharge her cargo.

The words connected with the Fine Arts cannot fail to be imprinted on the student's mind when he will have accompanied, in imagination, of course, a Japanese visitor to Paris to its museums and galleries, where the differ-

ent styles of painting and the characteristics of the great masters have been explained to him by a gifted teacher.

He cannot forget the terms connected with hunting, the animals hunted, the horses, etc., when he has followed a hunt in all its striking scenes, and has witnessed in imagination some of the accidents which that exciting sport causes at times, and has been present at the rather boisterous banquet which usually follows the return of the huntsmen.

Then for terms connected with the theater and music, he will visit the opera with our Japanese, and will hear and see all that takes place at such representations. In the midst of the opera there is an alarm of fire, and the words connected with such a scene are introduced under circumstances calculated to fix them thoroughly in the learner's memory.

Let us give a few examples. First, one of our heroes, a Japanese prince, is visiting Paris, and we take him to the Musée du Louvre.

Musée, *Museum*.
du Louvre, *of the Louvre*.
galeries, *galleries*.
de peintures, *of painting*.

peintures à l'huile, *oil*
paintings.
peintures à l'aquarelle,
water colors.

peintures à fresque, <i>frescoes</i> .	costume, <i>costume</i> .
peintures au pastel, <i>crayons</i> .	exciter, <i>to excite</i> .
rencontrer, <i>to meet</i> .	la curiosité, <i>the curiosity</i> .
artistes, <i>artists</i> .	des visiteurs, <i>of the visitors</i> .
peindre, <i>to paint</i> .	se contenter, <i>to be satisfied with</i> .
chevalet, <i>easel</i> .	de jeter, <i>casting</i> .
canevas, <i>canvases</i> .	coup d'œil, <i>a glance</i> .
esquisses, <i>sketches</i> .	à la dérobée, <i>on the sly</i> .
crayons, <i>pencils</i> .	de peur de, <i>for fear of</i> .
pinceaux, <i>brushes</i> .	blessar, <i>wounding</i> .
palettes, <i>palettes</i> .	la susceptibilité, <i>the susceptibility</i> .
mélanger, <i>to mix</i> .	de l'étranger, <i>of the foreigner</i> .
couleurs, <i>colors</i> .	de violer, <i>to violate</i> .
arc-en-ciel, <i>rainbow</i> .	les lois, <i>the laws</i> .
violet, <i>violet</i> .	de l'hospitalité, <i>of hospitality</i> .
indigo, <i>indigo</i> .	et de manquer, <i>and to fail</i> .
bleu, <i>blue</i> .	aux covenances, <i>in proprieties</i> .
vert, <i>green</i> .	délicatesse, <i>delicacy</i> .
jaune, <i>yellow</i> .	de sentiment, <i>of feeling</i> .
orangé, <i>orange</i> .	toucher, <i>to affect</i> .
rouge, <i>red</i> .	le prince, <i>the prince</i> .
sept couleurs, <i>seven colors</i> .	se plaire à, <i>to take delight</i> .
réunies, <i>united</i> .	reconnaître, <i>to recognize</i> .
dans le blanc, <i>in white</i> .	l'affabilité, <i>the affability</i> .
contraire, <i>contrary</i> .	
noir, <i>black</i> .	
absence, <i>absence</i> .	
de couleurs, <i>of colors</i> .	

la courtoisie, <i>the courtesy.</i>	Romaine, <i>Roman.</i>
des Parisiens, <i>of the Parisians.</i>	remarquable, <i>remarkable.</i>
causer avec, <i>to talk with.</i>	par le dessin, <i>by the design.</i>
connaisseurs, <i>connoisseurs.</i>	Vénitienne, <i>Venetian.</i>
faire remarquer, <i>to point out.</i>	par la couleur, <i>by the coloring.</i>
différents genres, <i>different kinds.</i>	Le Pérugin, <i>Le Perugin.</i>
de peintures, <i>the paintings.</i>	maître, <i>master.</i>
peinture d'histoire, <i>historical painting.</i>	de Raphaël, <i>of Raphael.</i>
peinture de genre, <i>life studies.</i>	l'Homère, <i>the Homer.</i>
peinture de portraits, <i>portrait.</i>	de la peinture, <i>of painting.</i>
peinture de marines, <i>sea subjects.</i>	fresques, <i>frescoes.</i>
peinture de paysage, <i>landscapes.</i>	du Vatican, <i>of the Vatican.</i>
peinture de fleurs, <i>flowers.</i>	rival de, <i>rival of</i>
écoles de peinture, <i>schools of painting.</i>	Michel-Ange, <i>Michael Angelo.</i>
	peintre, <i>painter.</i>
	sculpteur, <i>sculptor.</i>
	poète, <i>poet.</i>
	architecte, <i>architect.</i>
	basilique, <i>basilico.</i>
	de St. Pierre, <i>of St. Peter.</i>
	Rome, <i>Rome.</i>

Or one of the incidents in the voyage of a captain :

passager, <i>passenger.</i>	sur le pont, <i>on the deck.</i>
faire les cents pas, <i>to walk leisurely.</i>	bateau à vapeur, <i>steamer.</i>
	soudain, <i>suddenly.</i>

entendre, *to hear*.
 cri lugubre, *mournful cry*.
 un homme, *a man*.
 à la mer, *overboard*.
 ému, *moved with*.
 de compassion, *compassion*.
 danger, *danger*.
 de mort, *of death*.
 résolution, *resolution*.
 de sauver, *to save*.
 la vie, *the life*.
 de son semblable, *of his fellow creature*.
 se débarrasser, *to get rid*.
 de ses vêtements, *of his clothing*.
 se précipiter, *to rush*.
 dans les flots, *into the waves*.
 nager, *to swim*.
 plonger, *to dive*.
 saisir, *to seize*.

le noyé, *the drowning one*.
 efforts, *efforts*.
 surhumains, *superhuman*.
 lutter contre, *to struggle against*.
 les vagues, *the waves*.
 agitées, *foaming*.
 à bout de forces, *exhausted*.
 canot, *canoe*.
 force de rames, *to row vigorously*.
 ramener, *to bring back*.
 à bord, *on board*.
 sauveur, *rescuer*.
 remettre, *to restore*.
 l'enfant, *the child*.
 entre les bras, *to the arms*.
 de sa mère, *of his mother*.
 éprouver, *to feel*.
 une joie, *a joy*.
 céleste, *heavenly*.
 inexprimable, *unutterable*.

Or again, an incident in the experience of a traveler :

admirer, *to admire*.
 Notre-Dame, *Notre Dame*.
 cathédrale, *cathedral*.
 de Paris, *of Paris*.
 vaisseau, *building*.

Gothique, *Gothic*.
 filou, *pickpocket*.
 s'approcher, *to approach*.
 à pas de loup, *stealthily*.
 s'emparer de, *to get hold of*.

porte-feuille, <i>pocketbook</i> .	conduire, <i>to take</i> .
montre, <i>watch</i> .	en prison, <i>to the jail</i> .
au voleur ! <i>thief</i> .	lendemain, <i>on the morrow</i> .
agents de police, <i>police-</i> <i>men</i> .	comparaître, <i>to appear</i> .
courir après, <i>to run after</i> .	devant, <i>before</i> .
auteur, <i>the perpetrator</i> .	le magistrat, <i>the magis-</i> <i>trate</i> .
du larcin, <i>of the theft</i> .	entendre, <i>to hear</i> .
attraper, <i>to seize</i> .	déposition, <i>evidence</i> .
par le collet, <i>by the collar</i> .	témoins, <i>witnesses</i> .
se débattre, <i>to struggle</i> .	à charge, <i>against</i> .
mettre les menottes <i>to</i> <i>handcuff</i> .	et à décharge, <i>and for</i> .

But notwithstanding the interest of the subject-matter and the close connection of the words, it is not to be expected that a set of entirely new symbols can be thoroughly mastered by repeating them only once or twice in their natural order. If they are to become ready tools of the mind, and always at hand for the expression of thought, they must be repeated in different order several times, *i. e.*, a leading word being given, others in connection with it occur to the mind at once.

EXAMPLE.

Costume ? Exciter la curiosité des visiteurs. Peintures ? A l'huile, à l'aquarelle, à fresque, au pastel.

Couleurs ? Arc-en-ciel, violet, indigo, bleu, vert, jaune, orangé, rouge. Différents genres de peintures ? Peinture d'histoire, peinture de genre, peinture de portrait, peinture de marine, peinture de paysage, peinture de fleurs. Raphael ? L'Homère de la peinture, fresques du Vatican, rival de Michel Ange.

Or, Entendre ? Cri lugubre : un homme à la mer ! Se débarrasser ? De ses vêtements, se précipiter dans les flots, nager plonger. Danger de mort ? Résolution de sauver la vie de son semblable.

Or again, Filou ? S'approcher à pas de loup, s'emparer de, porte-feuille, montre. Notre Dame ? Cathédrale de Paris, vaisseau Gothique. Au voleur ? Agents de police, courir après l'auteur du larcin.

This kind of exercise will certainly make newly acquired words thoroughly familiar to the mind of the learner ; but in order to render the impression still more lasting two other exercises may be successfully employed, as follow :

CONVERSATION.

Que faut-il aux artistes pour peindre ?

Il leur faut un chevalet, un canevas, des pinceaux, une palette et des couleurs.

Quelles sont les sept couleurs primitives ?

Le violet, l' indigo, le bleu, le vert, le jaune, l' orangé, et le rouge.

Qu'est-ce que le noir ?

C'est le contraire du blanc et l'absence de toute couleur.

COMPOSITION.

Le prince rencontra un connaisseur dans les galeries du Louvre. Celui-ci lui fit remarquer les différents genres de peintures qui s'y trouvent ; les peintures d'histoire, les tableaux de genre, les paysages, etc.

Or, Un passager qui faisait les cents pas sur le pont du bateau à vapeur entendit soudain ce cri lugubre : un homme à la mer. Il fut ému de compassion et prit aussitôt la résolution d'exposer sa vie pour sauver celle de son semblable.

“ Exercises arranged in this manner, far from being tedious, are very interesting, as they are varied, thus bringing into action the highest qualities of the human mind—the conceptive, logical, constructive, and imaginative faculties—and so while the student is learning a language, his mind undergoes a thorough discipline.

LAWYERS' MEMORIES.

Lawyers require strong memories, and the most able men in the profession are very gifted in this respect. Indeed, it is partly owing to this that they rise above the level of their

fellows. I have made considerable enquiry among this class of persons to discover if they have any method of training their powers of recollection, and find that in a majority of cases they have none. Their memories grow in strength by the natural exercise they receive in the daily course of their work.

I can hardly conceive of any discipline of the mental powers nor of the memory so thorough and exacting as that which a lawyer receives while trying a great case. If he forgets any point of importance it may be lost, so he must depend partly on system, notes and briefs; but previous discipline, according to the rules of this work, and a thorough training of the memory, will be of the greatest advantage. I have known lawyers to ruin their memories by too great anxiety over a case, by going without sleep, by keeping up their strength with stimulants, and by the excessive use of tobacco. I cannot think of anything more injurious to this faculty than such a course.

I have found in my investigations among lawyers what I did not expect: that in large cities there is a class of them whose memories actually deteriorate. They are generally young

men of fair ability, who begin in offices as assistants, on a very small income. Their round of duties is monotonous; they work early and late, occupying, it may be, the worst ventilated rooms; bend over their tasks at their desks, taking little or no exercise; they smoke and drink, it may be, sit up late nights, and perhaps dissipate some. Their health suffers, their brains grow weak and their memories become less and less. Instead of rising in their profession they fall. Nothing can be done for them unless they cultivate their bodily strength and adopt more natural and robust methods of living. When they do this they need only to persistently follow the rules laid down in previous pages of this work to double and quadruple their powers of remembrance, and at the same time increase their intellectual strength. Why a young man should allow his brain power to deteriorate in the early part of his career, by bad habits and lack of discipline, has always been a mystery to me. As age comes on, the decay of the faculties and diminution of their force cannot be prevented altogether; but the young have no such excuse.

I have sometimes thought that if the early

education of young men who expect to become lawyers, and, indeed, of all young men, were more natural and consisted of less book learning and more out-of-door life, there would be a better foundation for more powerful memories and stronger intellects. The case of Chancellor Kent will illustrate what I mean. Of his early education he wrote:

“I was brought up among the highlands and hilly parts of Connecticut, and was never kept on the high-pressure plan of instruction. It was not then the fashion. I went to school, and studied in the easy, careless way until I went to college. I was daily, and sometimes for a month or more, engaged in juvenile play, and occasional efforts on the farm. I was roaming over the fields, and fishing, and sailing, and swimming, and riding, and playing ball, so as not to be but very superficially learned, when I entered college. I was not in college half the time. I was at home, at leisure, or at gentle work, and much on horseback, but never in the least dissipated. I easily kept pace with my class, for it was in the midst of the American War, and there were few scholars, nor much stimulus to learn. *Silent leges inter*

armas. When I went to study law, I had my my own leisure, and great exercise and relaxation in enchanting rides, and home visits, until I got to the bar. I lived plainly—drank nothing but water, ate heartily of all plain, wholesome food that came in my way—was delighted with rural scenery, and active and healthy as I could be. Here I laid the basis of a sound constitution, in which my brain had not been unduly pressed or excited, and only kept its symmetry with the rest of the animal system. It was not until I was twenty-four that I found that I was very superficially taught, and then voluntarily betook myself to books, and to learn the classics, and everything else I could read. The ardor and rapidity with which I pursued my law and literary course were great and delightful, and my health and spirits were sound and uniform, and neither has faltered, down to this day.”

I suppose we shall never educate all our young men and women after this fashion. Parents are too eager and desirous that their sons shall improve their youthful days in acquiring knowledge rather than the developing of strong bodies, and they often sacrifice their

health, and sometimes their lives, in this vain desire. It is very desirable that our youth have their intellectual faculties well trained; it is absolutely necessary that their moral instincts be as well developed; but best of all it is when the intellect, moral nature, and the physical part of our being are harmoniously blended together in one individual.

SUGGESTIONS FOR CLERGYMEN.

The profession of a clergyman does not require such sudden and powerful exercise of the memory as that of the lawyer when pleading a great case, but he has opportunities for its more natural development, providing he will use them.

The habit of writing and reading sermons is detrimental to this faculty, however valuable it may be in a literary point of view. If preachers would form the habit of extemporaneous delivery, and at the same time use as much care in the preparation of their discourses as when writing them, they would be much more forcible. I do not say that a preacher cannot read a

finely written sermon effectively, but as a rule they do not. For this reason I urge all members of this profession to early form the habit of delivering their discourses extempore. This will require that they learn to think on their feet, which is a gift well worth making great effort to attain. It will also form most excellent means of training the memory. If the discourse has been written out in full, it may be committed by heart, or after the matter has been well worked up, the principal divisions and main points may be written, and the filling up left to the inspiration of the moment. This latter is, on most occasions, Mr. Beecher's method, and it certainly works well in his case.

Ministers who have a ritual and much of the service prepared for them become lazy intellectually, unless they keep a close watch of themselves. In such cases the memory must suffer. There is no royal road by which it can be kept strong, except by right use; and by right use I do not mean constant use.

Some clergymen keep their brains on a continual strain. The result is, this organ loses its elasticity, which is as injurious to the memory as to all the other faculties. In such cases

relaxation, the throwing off of cares and responsibilities, and allowing the mind to remain fallow for a while, is most beneficial. Multitudes of forgotten things often come back to the mind without effort after a long-continued strain has been taken from the nervous system. The annual vacations which clergymen take must prove of the greatest advantage as a means of relaxation ; but there should also be a certain amount of daily relaxation besides. There are many ways in which this may be done, according to individual tastes and requirements. Dr. John Todd made his machine shop furnish a change, and he wrote me an elaborate account of this room and what it had done for his intellectual health, which I published some years ago in a little work entitled "Hygiene of the Brain." Others, who have no mechanical genius, take to horseback riding, gardening, out-of-door sports and various forms of athletics, each and all of which are useful, not only for the general health but for the memory.

Some will think I have gone out of my way to give general hygienic advice in a book written to show how the memory may be strength-

ened; but I have seen so many memories debilitated from the violation of hygienic laws that it seems to me these suggestions are not out of place.

MASTERING THE CONTENTS OF A BOOK.

One of the most useful and yet one of the most difficult things to do is to master the contents of a good book. As a method of training the memory it has special use. Of course not every book is worthy of so much attention. One should be chosen which is really valuable, and, better still, if it has special reference to the tastes and requirements of the individual. It should be read with care. This cannot be done rapidly, especially at first. The attention should be so fixed on the main points as to secure a vivid impression. If the reader finds he is not giving close attention, and the facts or thoughts are not properly impressed on the brain, then he must at once stop and begin again.

After a chapter has been read once the reader should make an abstract of it from

memory. The abstract should be very concise, only what is valuable being retained. The chief ideas will always suggest the less important ones if the attention has been carefully exercised and the first impression has been clear and vivid. After the synopsis of a chapter has been made it should be compared with the original to see if it is correct, and if it is not it should be made so. Continue with the second chapter in the same way. Before proceeding to the third chapter read over the synopsis of the first and second, and link them together into one chain by the method most natural and convenient, and proceed in this way to the end of the volume. After it has been finished, the complete abstract should be read over with great care, and another briefer one made from memory. This process of condensing books is a valuable intellectual exercise, and helps one to understand into how little space a good work may be compressed.

After all has been done which I have advised, the reader should repeat to his friends and those who are willing to listen, the contents of the book as he has made them in his synopsis, without the assistance of his notes.

This will give confidence, which is most essential to success. The more times this repetition is gone over the better. This process of condensing the contents of a book is almost a sure cure for loose habits of recollecting, which come from too much and too rapid miscellaneous reading.

THE ART OF FORGETTING.

When Simondes offered his services to Themistocles as a teacher of the art of memory, the latter replied, "Rather teach me the art of forgetting!" There was wisdom in this reply. Who would not forever forget many things he has learned, especially his bad habits, his false opinions, his painful experiences?

The progress of the race is slow because we cannot or will not forget those things we learned in early life, which were not true; but we go on teaching them to our children simply because they have become a part of our brain structure and action.

The art of forgetting, it seems to me, consists in using our reason to judge and our wills

to expel from the mind what is of no use, and also in occupying our attention with those things which are valuable. Keep the mind open to new truths and the old will gradually be forgotten. There are some conditions of the nervous systems in which the brain seems to act automatically, and to go over and over the painful and trying experiences of life. Try as hard as we can we cannot forget them. The best advice I can give to such is to take measures to make new associations for the thoughts, so as to call them into fresh and agreeable channels.

There are some occasions which will require the most powerful exercise of the will, as, for instance, when we wish to prevent vivid impressions from gaining a permanent foothold in the brain. The person must resolve and insist in the most positive manner that his brain shall not treasure up its painful and worthless experience. I remember an instance of this kind in my own life. I was riding on the cars between Cleveland and Columbus, Ohio, when one of the wheels of the engine broke, and the whole train, in full motion, was thrown down an embankment and turned

bottom side up. I was not in the slightest degree hurt or alarmed, yet for a year after this I could not ride on the cars with the same comfort I had previously, because the memory of the accident, and all its attendant circumstances, would come back to me unbidden. Time, however, and determination on my part restored the nervous system to its normal condition; and now I only remember the accident long enough to relate it to illustrate the value of the art of forgetting.

ABNORMAL MEMORY.

There are some instances of abnormal memories which have interest for the student of mental science. A typical case was published some years ago in the *Journal of Speculative Philosophy*, the subject being an uneducated farm laborer, past middle life, whose memory in certain directions was prodigious. According to the account he could tell instantly what day any day of any month was twenty or more years back, what he had done on that day, what kind of weather it had been, whom he

had seen, etc., etc. He had been tested by almanacs and diaries so many times and found to be correct, that his word was never questioned by those who knew him. He had not cultivated his memory, and this faculty was evidently born with him. In other respects he was not remarkably intelligent; indeed, his memory was, without doubt, abnormal, and perhaps prevented the higher development of his other faculties.

Another interesting case, which was related to me by a gentleman who was very intimately acquainted with him, is that of a printer whose employer made his memory serve a useful purpose by frequently referring to him for particulars of any event which had transpired connected with the practical work of the printing office. For instance, when any customer sent an order to duplicate any piece of work, instead of spending time in hunting through his books to find the order he referred the matter to this man, whose memory was so good that he would promptly give every particular—the size, color and weight of paper, who printed it, on what press it was worked off, the day it was completed—all this correctly, although

months, and in some cases years, had elapsed in the meantime. His memory was equally good regarding things not connected with his daily work. When he was asked how he could remember so long back, and such a multiplicity of difficult things, and if he kept a diary, he replied that he did not know how he did it, and that he had no time to keep a diary. It was evidently a gift of nature, and goes to show how much more capable human beings may some time become, when they shall be born with all their faculties more fully and harmoniously developed.

CONCLUSION.

In concluding this little work I should like to express my thanks to the many kind friends who have aided me by suggestions and material. They have made the labor light and a pleasure. Hoping the work will do something to improve the memories of those who read it is all that I can wish.



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